THE MODEL WORLD AT YOUR FINGERTIPS

MECCANO MAGAZINE

THE MODEL WORLD AT YOUR FINGERTIPS

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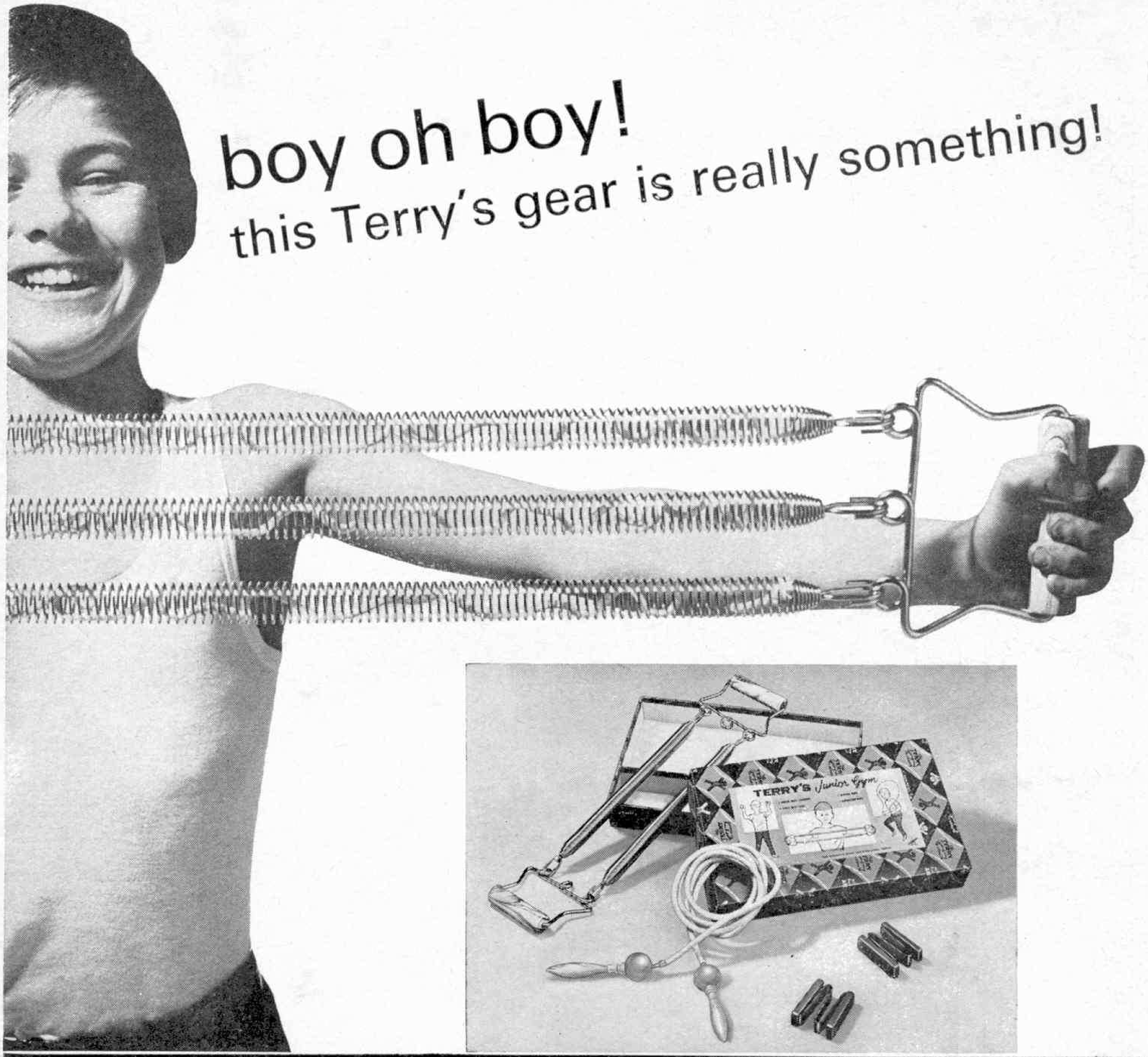

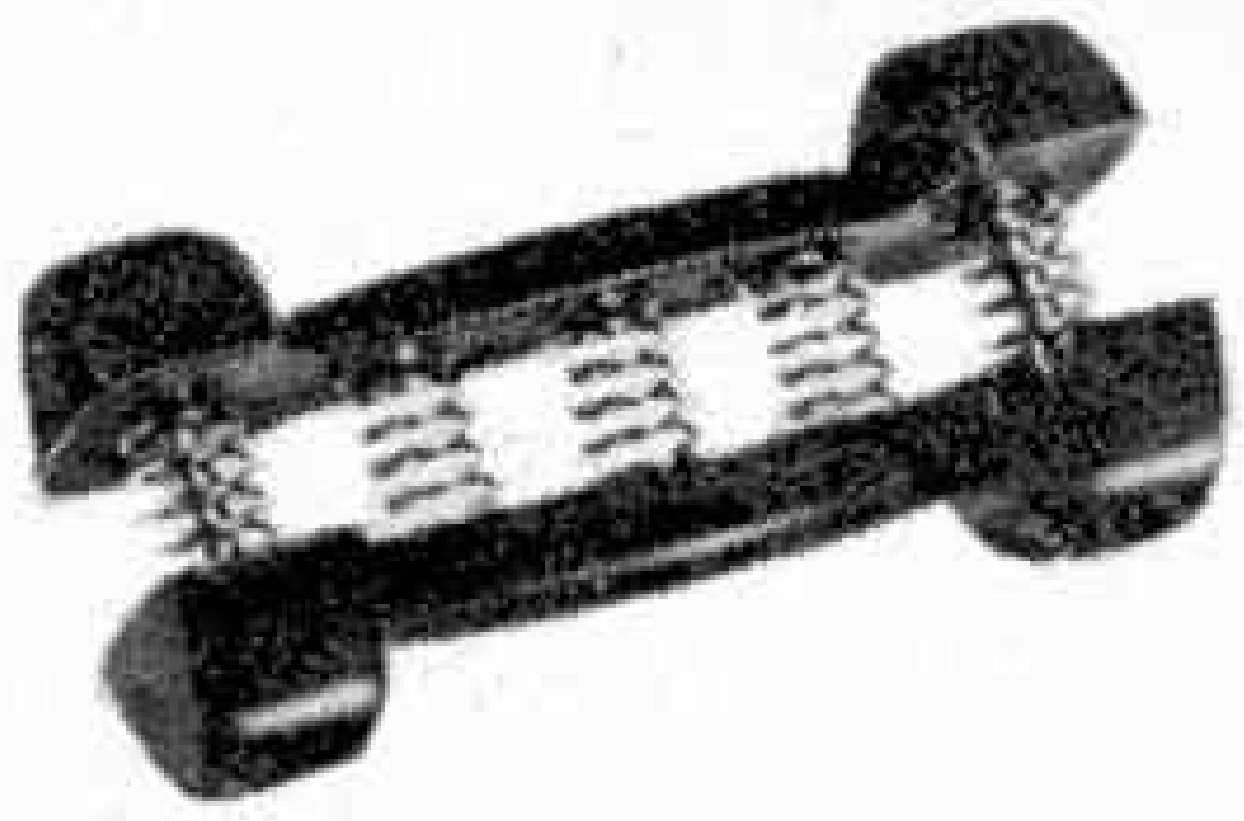
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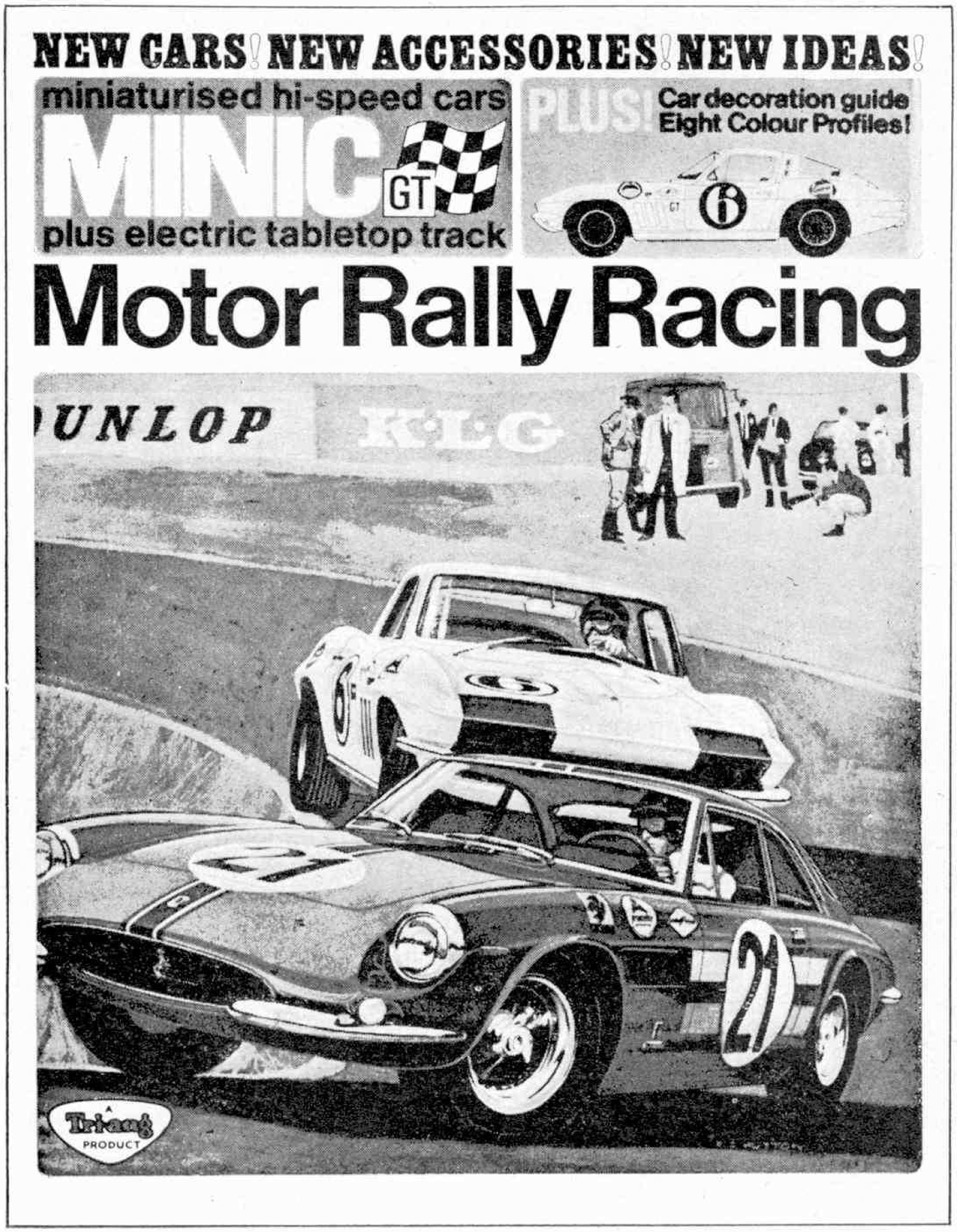

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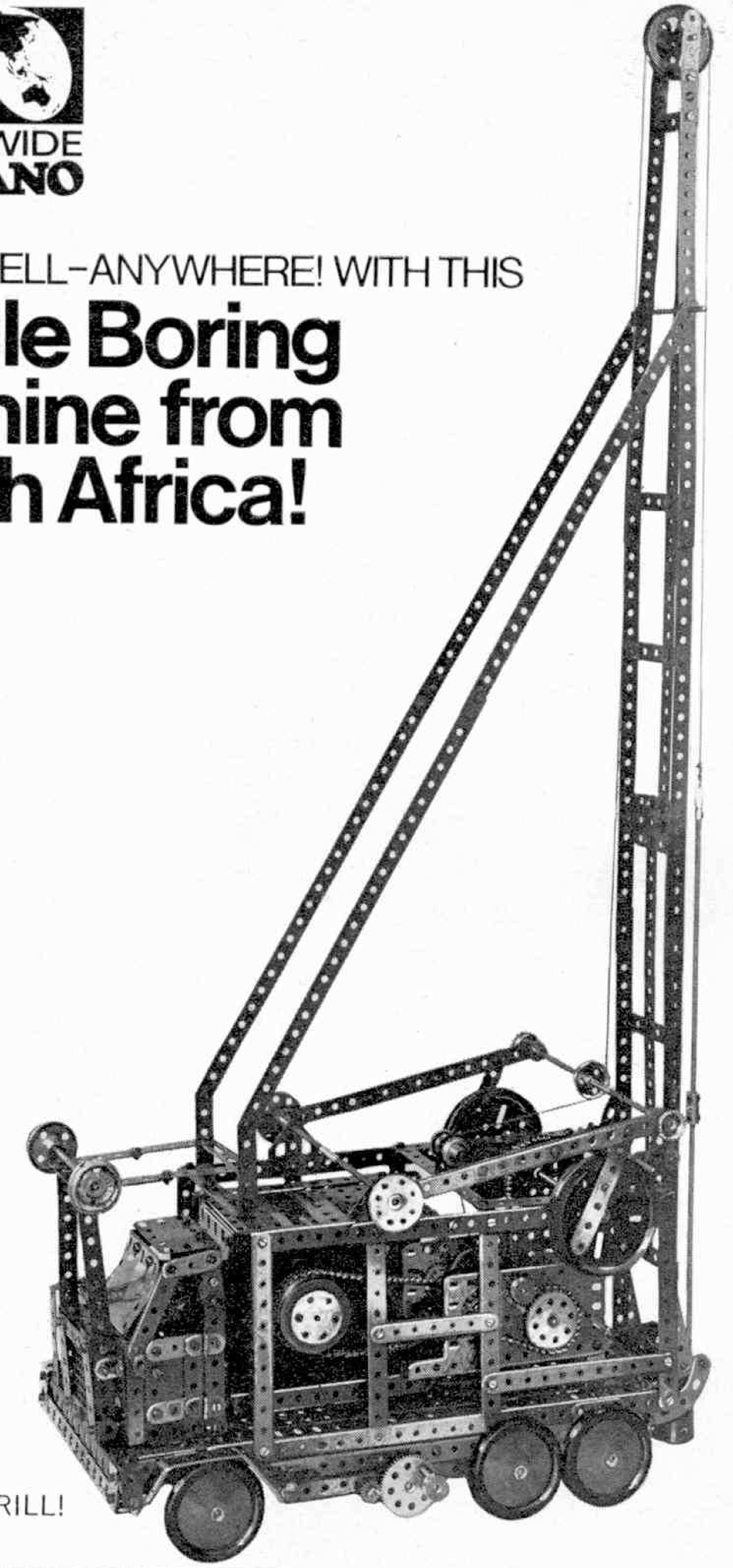

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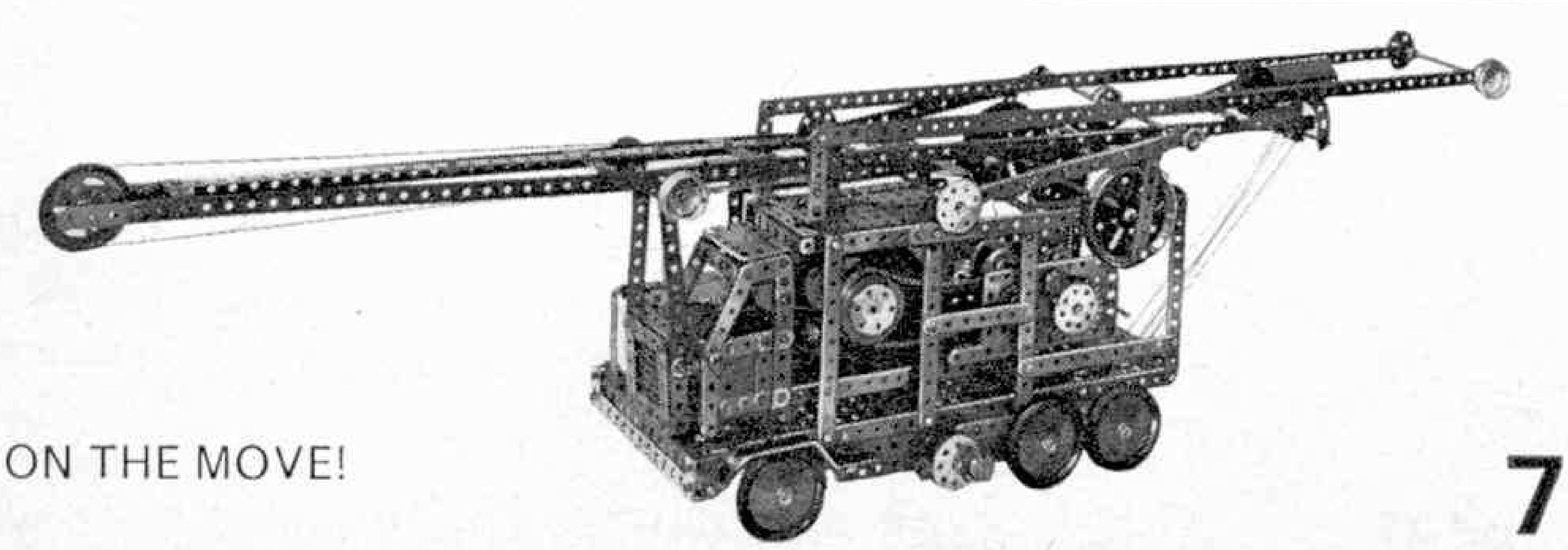

ON THE MOVE!

7

A young enthusiast in Uitenhage built this fine model. He's sixteen now and has been building with Meccano since he was eight years old!

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This is yet another example of the marvellous models that are made by Meccano enthusiasts around the world. Original, ingenious; simply clever or cunningly detailed; practical, entertaining, educational . . . lots of descriptions apply to these masterpieces, and you can build them for yourself.

If you are already an enthusiast, you'll know the fascination of building with Meccano, and how to extend your range with the conversion sets. But, if you have yet to discover the thrills of Meccano, there are ten fabulous sets you should know about . . . from 15/3 (if dad's a stockbroker, we have one set at £56.10.0). These are complete with instructions for making hundreds of models that really work.

We should like you to write about any models you've made which you think would be of interest to other Meccano enthusiasts round the world. Please send photographs and descriptions to Meccano Ltd, Binns Road, Liverpool 13, England.

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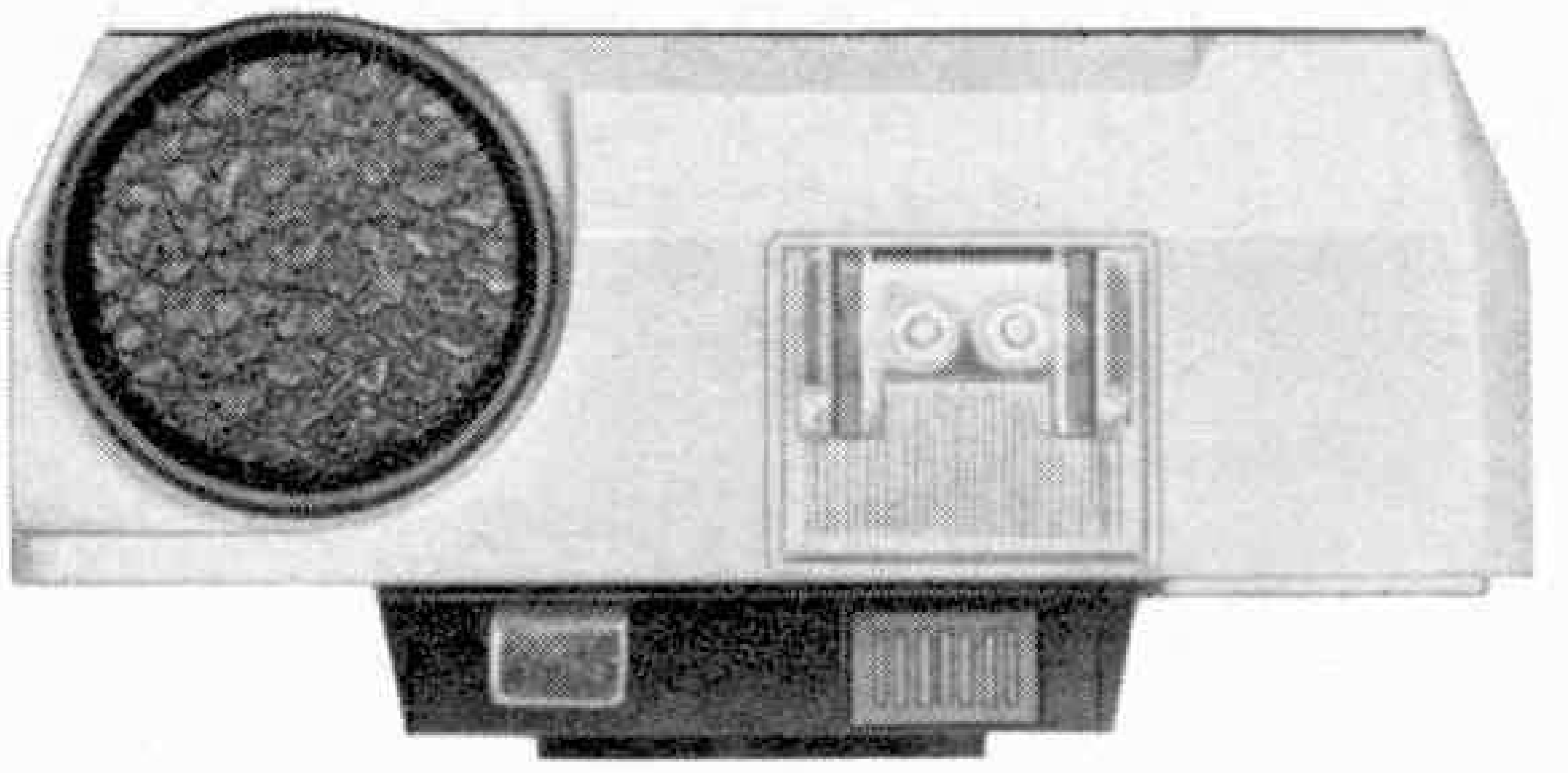

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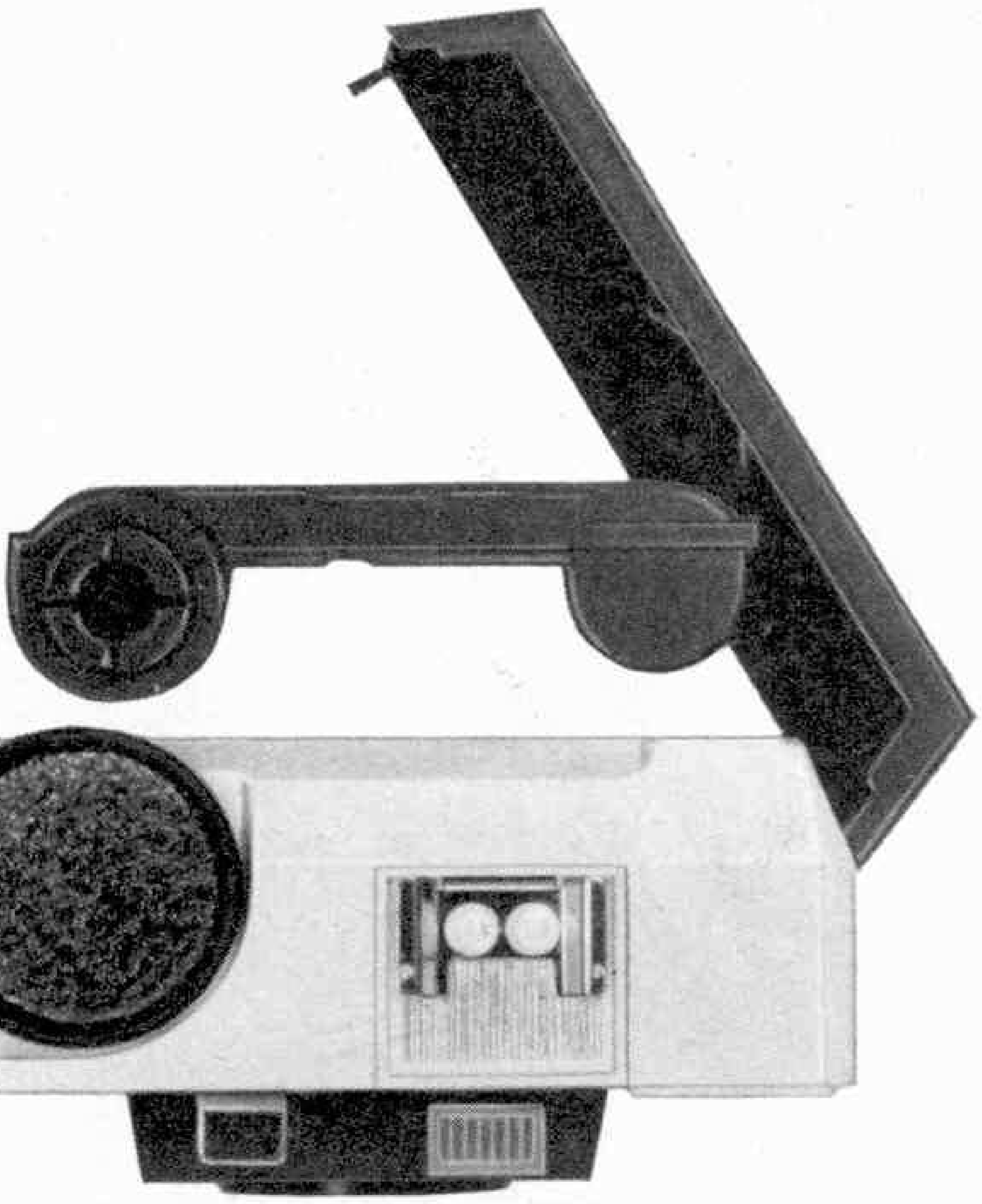
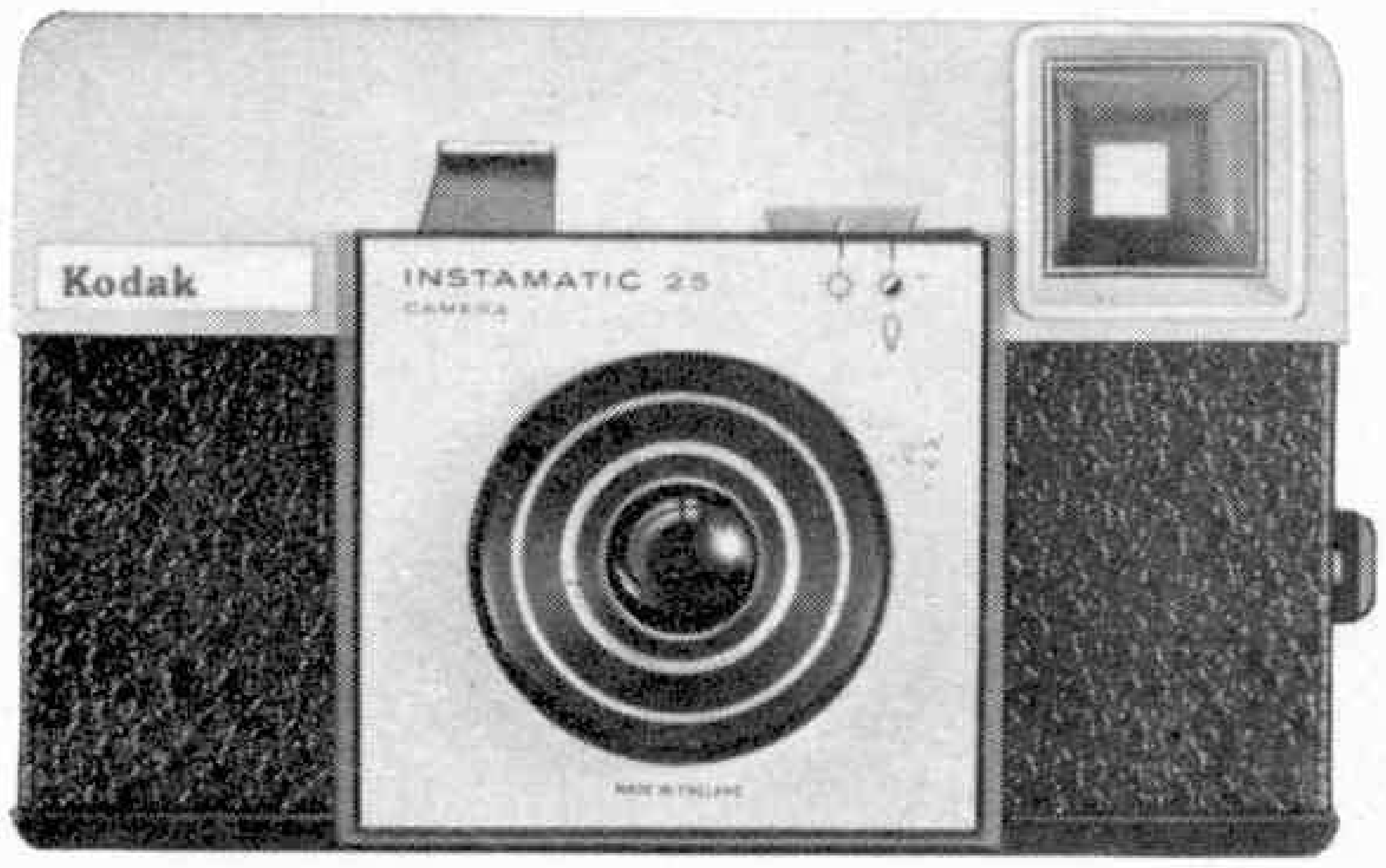


get set



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THE MODEL WORLD AT YOUR FINGERTIPS

MECCANO MAGAZINE

THE MODEL WORLD AT YOUR FINGERTIPS

APRIL 1967 VOLUME 52 No. 4

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ON THE COVER: A long, gleaming, red and silver Freightliner train snakes its way through the London countryside on its way north.
The Freightliners are British Railways' symbol of the future, and on page 6 of this issue Mike Rickett describes these ultra modern Freightliners in detail.

Photo: courtesy of British Railways.

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The computer is the symbol of the sixties. Around the computer, a whole new industry is based, and its programming, maintenance and operation have opened up promising new careers for ambitious school leavers. Computers are now an essential part of industry and commerce; increasing efficiency and improving the lot of every one of us.

Commercial computers often occupy whole buildings, and their cost frequently runs into six figures so, you might think, the owning of a personal computer would be beyond your wildest dreams. Not so! This month we begin a series of articles in which we will show you how you can actually build your own electronic digital computer. It can be done in easy stages, so that you won't have to save up for a year before you can afford the bits! Every stage will work on its own, but for practical purposes you should aim at a minimum of six stages.

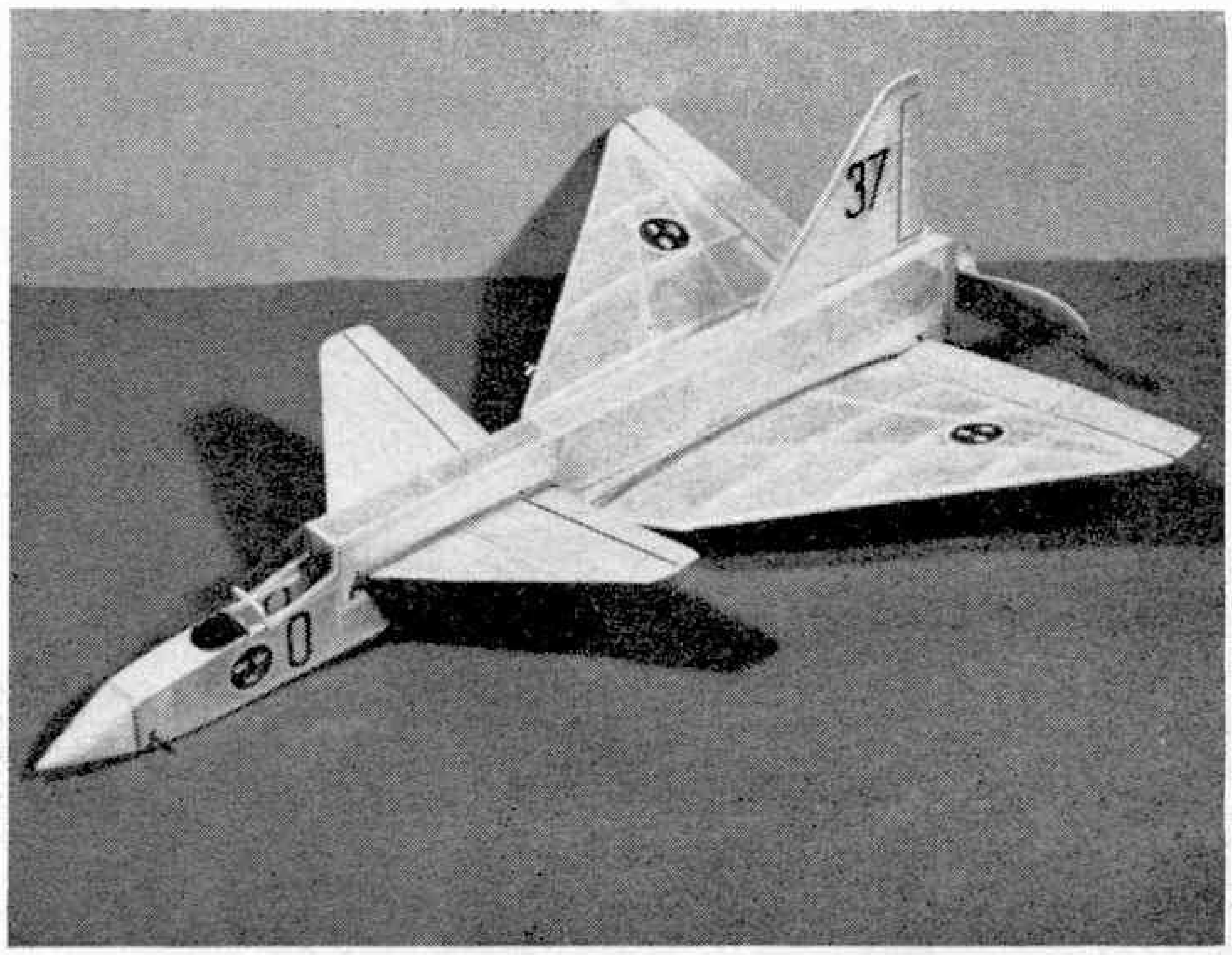
This is an ideal group project for a school electronics class, but although it will do quite advanced sums in a trice, we think it will probably be locked away at the end of term!

British Rail are also moving rapidly into the computer age, and our leading article this month describes the very latest method of handling rail-freight—the Freightliner. This highly organised and ultra modern system is derived from the old 'container' system, but the modern Freightliner depot, with its huge cranes and lavish mechanical handling equipment, bears little resemblance to the small local goods yards of yesteryear. Modern developments on the railways always provide a challenge to the model railway fan who likes his layout to be bang up-to-date, and what better way to boost your 'modernisation plan' than with a Freightliner terminal?

If the present unseasonably mild weather is turning your thoughts towards summer holidays, then turn to pages 12 and 13 to complete the illusion! The 'Scillonian', drawn and described by Ian Stair, will be a familiar sight to readers who retreat to the Scillies or Cornwall for their holidays. It is certainly a very attractive little vessel, and would make a nice 'waterline' model. Food for thought!

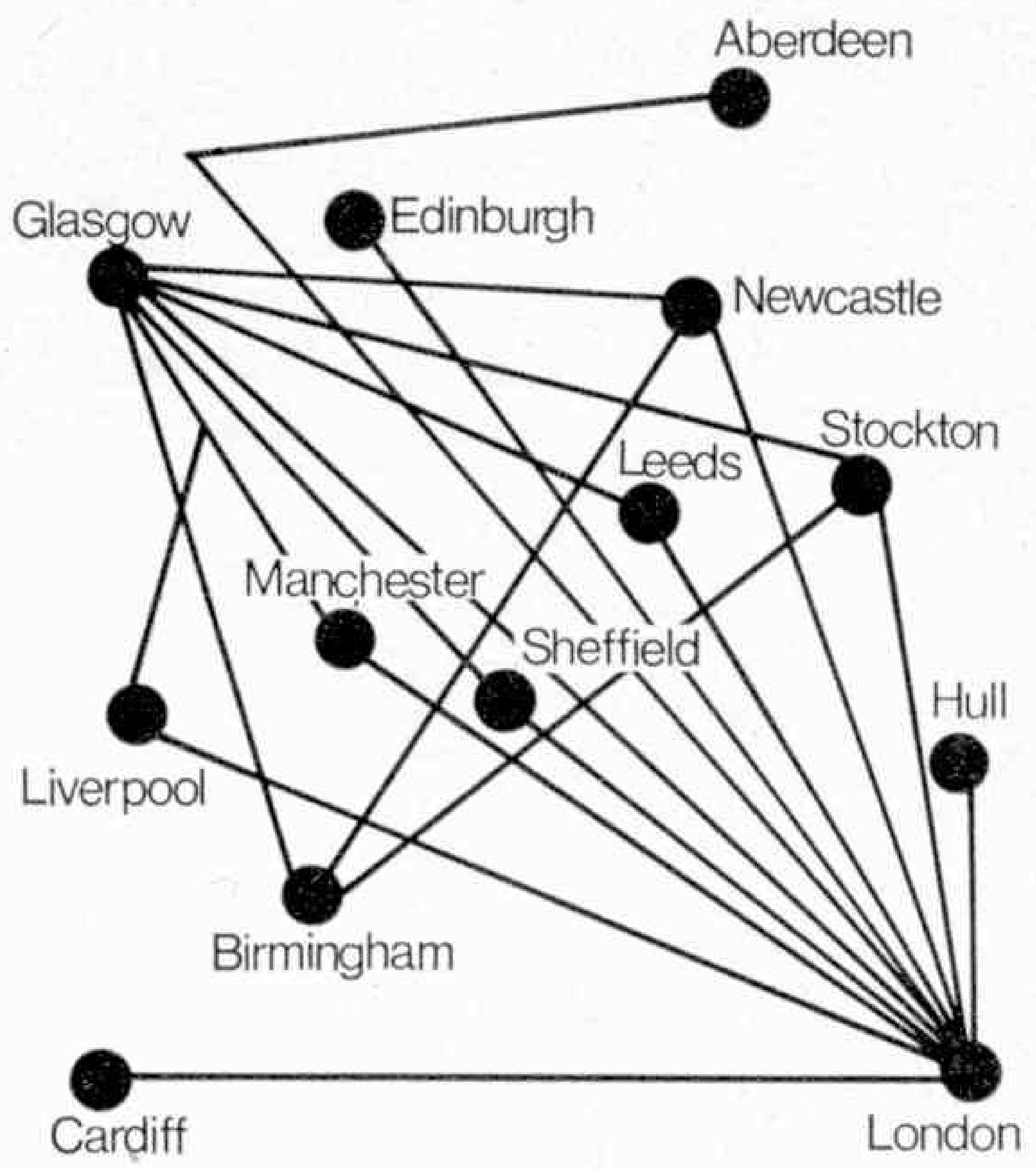
Something out of the ordinary this month is an article on birdwatching. Our computer represents the most up-to-date hobby it is possible to conceive, whereas birdwatching must be one of the oldest. Perhaps you can think of some way of bringing the two together, after all, birdwatching involves the collection of a lot of data and statistics—the computer's staple diet. Between these two extremes there's something in this month's issue for just about every hobby taste, and to whet your appetite for the May issue just take a look at the picture below, then go out and order your copy to be sure of getting it.

NEXT MONTH.—FULL SIZE PLANS for this magnificent flying scale model of the very latest Swedish interceptor fighter—the SAAB VIGGEN. It's so new, that even the full size one has not yet flown. The first flight is due any day now—see if you can beat it!



Rail Freight '67

It would not be exaggerating unduly to say that more changes have occurred to Britain's railway system in the last five or six years than during the previous hundred years. We have seen the transformation and complete re-building of an entire main line into a high speed, efficient, electrified route. In just five years, we have witnessed the final eclipse of the steam locomotive by new forms of motive power. Fresh organisation has brought with it, new ideas and methods which have succeeded in changing one of the oldest railway systems in the world into a bright, businesslike undertaking, determined to be competitive in an age when road transport threatens its very existence.



By Mike Rickett

A Glasgow bound Freightliner train leaves York Way terminal, London

AMONG the new ideas and methods, and very much part of the story of our new British Railways—or British Rail as it calls itself—is the 'Freightliner', an idea that has revolutionized the carriage of freight and aroused the interest of the world.

The Freightliner train, which, incidentally, is featured on our cover this month, is an entirely new concept in this country. In fact, freight has been carried in basically the same way since the days of the Liverpool and Manchester and Stockton and Darlington railways, when the manufacturer transported goods to his local rail head for it to be transferred to a wagon or van which was marshalled, often in a predetermined order, into a goods train. As Britain's railway system grew, the operation of goods trains became immensely complex, requiring mammoth sorting and marshalling sidings at places such as Edge Hill, where there was built one of the largest 'gridirons' in Britain.

Because of the very size of the railway system inherited by British Railways, considerable delays resulted from wagons having to be sorted and marshalled several times before they reached their destinations and many manufacturers found that the most economical way of transporting freight from one part of the country to the other was to run complete or 'block' trains, which did not have to be sorted and which could be run almost direct from point A to point B. Many railway companies also introduced a container, filled by the manufacturers and transported by road to the nearest goods yard where it was placed on a four wheel flat wagon and sorted into a goods train in the normal way.

This gave a door-to-door service, and can be said to be the forerunner of the Freightliner, which was developed under the impetus of the Beeching Report, first published in 1963. In this, was envisaged the use of 'Liner Trains' as a system of transport 'based on the joint use of road and rail for door-to-door transport of containerised merchandise'. Fundamentally, this is the old container idea modernised and streamlined, combining the advantages of road transport for door-to-doot service, with the advantages of rail for carrying heavy loads over long distances at fast speeds.

The predecessor of the Freightliner was the London to Glasgow and Birmingham to Glasgow 'Condor' and London to Manchester 'Speedfreight' trains, which were first introduced in 1963. These gave very promising results and led to the approval of £6 million for the development of Freightliner services, introduced initially in 1965 between Glasgow and London. Freightliners had only 30 containers provided for 20 customers by the end of their first week of operation, and in the first month, the number of containers carried was 214. Only a few months later, however, the total number of containers exceeded 10,000.

Recently, approval was given for the spending of a further £6 million on the development of a freight network by the end of 1967. Already, the first stage of the national Freightliner Grid envisaged in the Beeching Report is almost complete. About 50 Freightliner terminals will eventually be built in the main centres of population and industry, six of which, at London (York Way and Kings Cross), Glasgow, Manchester, Liverpool and Aberdeen, are already built and handling a steadily expanding amount of traffic.

In the short time that the Freightliner service has been in operation, Manchester, Glasgow and Liverpool each handle four trains daily, two arrivals and two departures. The busiest of the terminals, however, is London York Way, where no less than six trains arrive or depart every day.

During 1967, a further ten Freightliner terminals at Birmingham, Cardiff, Edinburgh, Hull, Leeds, London (Stratford), London (Willesden), Newcastle, Sheffield and Stockton will be opened and a network of 190 routes established between these. Since the service was first started, nearly 29,000 containers of general merchandise have been carried and existing services are running at the rate of 60,000 loaded containers every year. Over 50 different types of traffic for over 600 customers have been carried, ranging from bitumen compound to radio and television sets, gas cookers, bottles of beer, cigarettes and laundry.

Each Freightliner train consists of fifteen permanently coupled flat, low, 62 ft. long wagons, about the same as the standard carriage, with disc air brakes for running at speeds of up to 75 m.p.h. Considerably lower than the standard railway wagons, they have bogie wheels only 2 ft. 8 in. in diameter instead of the usual 3 ft. 1 in., to give clearance for the larger containers which are 8 ft. wide and 8 ft. high, to conform to the new international standard.

The saving of time that Freightliner trains give is partly due to the fact that they travel direct from terminal to terminal and are not sorted in marshalling yards. In addition, they are also expected to average a speed of 50 m.p.h. with a maximum of 75 m.p.h. throughout their journeys and are designed to run the surprising total of 100,000 miles in service each year, as against not more than 2,500 miles for wagons operating on the traditional system. Without the three types of specially designed container, each in the new red and white livery, Freightliners would not be the success they are, for these are the units on which the service hinges. Of the three, one is an open container, made in two lengths, 20 ft. and 27 ft. to take 15 and 20 ton loads; the other is an insulated container used on the Aberdeen meat service to take 16 tons; and finally there is a covered container in 10 ft., 20 ft., 27 ft. and 30 ft. lengths.

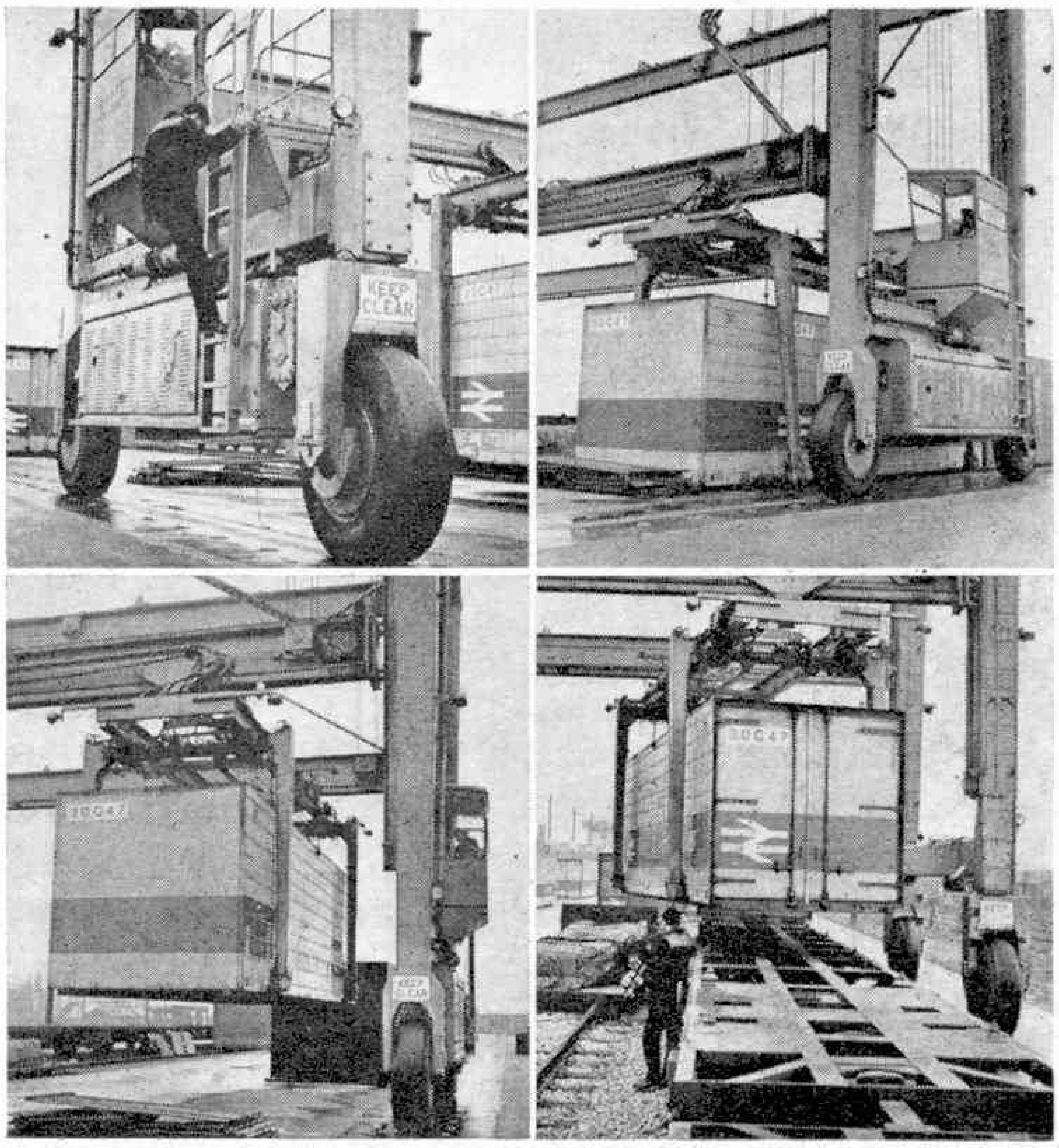
Although these are standard container designs, it is possible for manufacturers to have their own containers built to standard specifications but painted in their own liveries. Examples that come to mind are Unilever and Cunard. All containers locate on to special spigots fixed on the wagon frame, so that no ropes or chains are involved in keeping the container in position. Each wagon can also accommodate any number of containers to the total length of 60 ft.

All containers are specially designed to allow quick transfer at Freightliner terminals between rail and road wagon. The terminals are designed to assist this, and basically they are nothing more than numbers of parallel tracks and road lanes, spanned by a new kind of gantry crane called a Travelift. Initially imported from America, but now made in this country by Rubery & Owen Co. Ltd., the cranes straddle the tracks and roadways and move up and down on large rubber tyres. So efficient is the operation that two cranes can load or unload a train of 40 containers in an hour. The secret is the four giant arms on the Travelift which engage in pockets in the base of the container and which hold the container firmly without any need for shackles or hooks. In addition, the hydraulic action of the Travelift ensures that the container is lifted gently and swiftly from one vehicle to another, even over the top of another container if necessary. A radio link between the crane operator and the ground crew helps to speed the process of handling the containers. As the Freightliner network grows and the terminals expand, the Travelifts will be replaced by larger transporter cranes spanning at least five tracks and able to place containers on four adjacent road lanes.

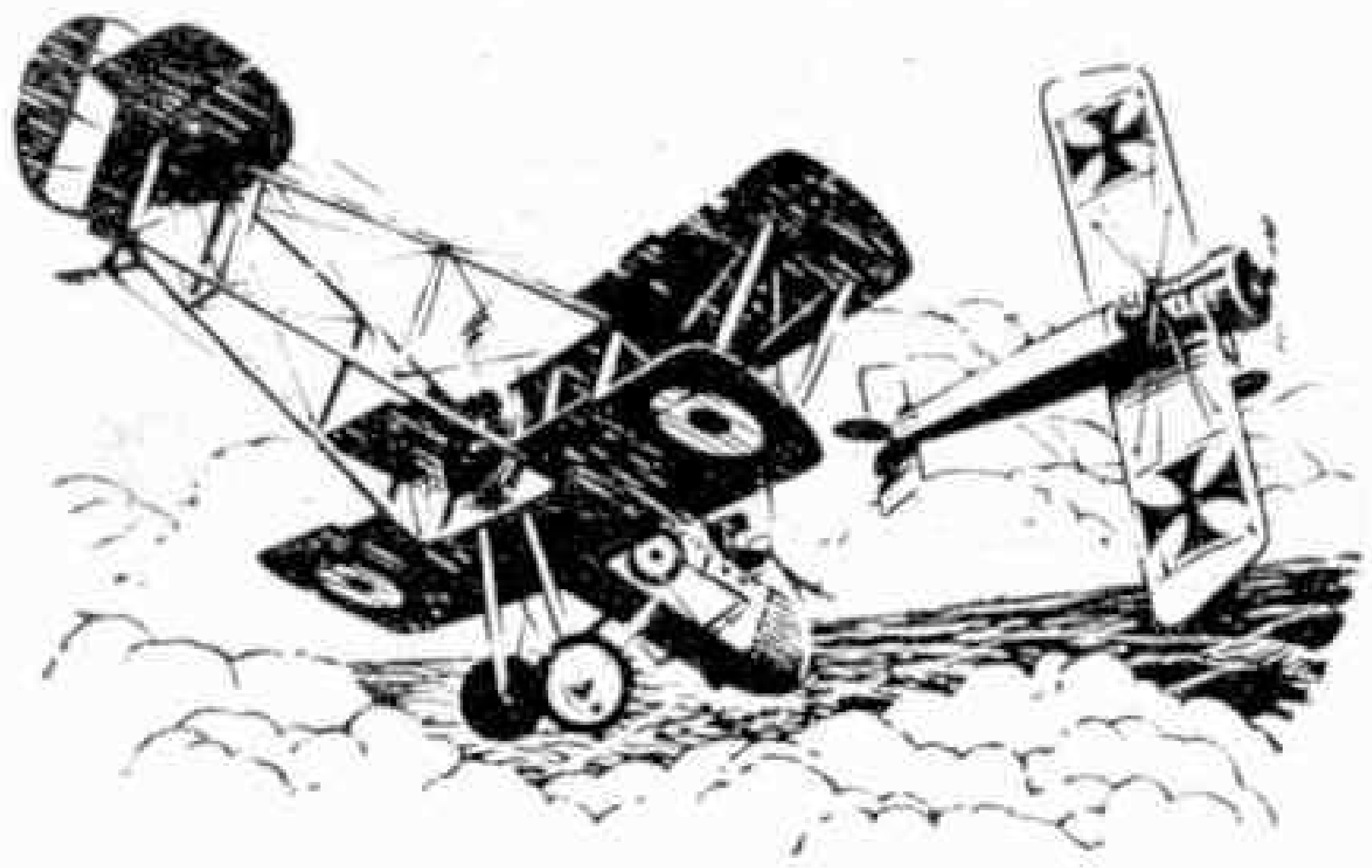
Freightliner trains from York Way to Liverpool and Manchester are hauled throughout by electric locomotives. Those to Scotland by this route are all electric between London and Crewe, where a Brush Type 4 locomotive is coupled on. Both these and English Electric Type 4 engines have been specially fitted with air brake equipment for working these trains.

Freightliners make it possible for British Rail to establish itself once again as the principal carrier of goods over medium and long distances. Indeed, about twenty-four foreign railway administrations have already sent representatives to Britain to inspect the equipment and methods of operation, which are now in advance of any in the world.

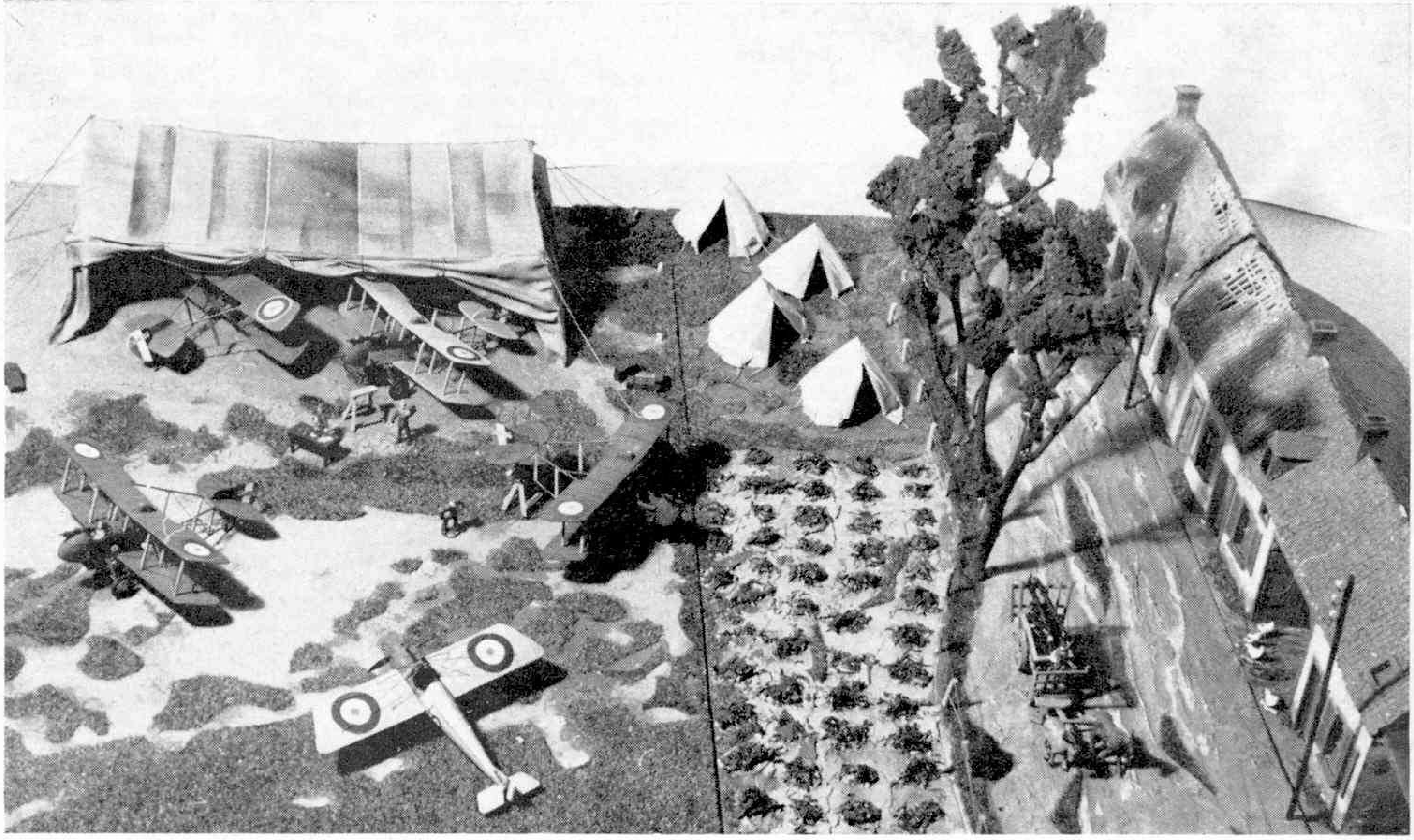
Below are some close-up views of a giant Travelift crane used to load and unload the Freightliner Containers. The crane itself runs on enormous rubber tyres



Home of the fighting scouts



Part 2—Making the Hangar



In our last issue we showed you how to prepare the baseboards for your model aerodrome. This month we are going to make a model canvas hangar, typical of the type so widely used by squadrons of the Royal Flying Corps on aerodromes in France during the First World War. You could make several, depending on the space available for your model aerodrome, as they are cheaply and quickly produced.

There were, of course, many other types of hangar employed by the R.F.C. but this type was probably the most picturesque and was a prominent feature of most front-line aerodromes. Major L. G. Hawker V.C., who commanded the famous 24 squadron, was a member of the Royal Engineers before he transferred to the Royal Flying Corps. From his experience in the Engineers he designed a more permanent wooden type from easily obtainable local materials and this type was also widely used on the Western Front.

FOR your model you will require the following materials. A piece of thin grey card, obtainable in large sheets from most art shops. White card would do, but the grey variety is very useful for the buildings we will be describing in a later issue. One 3 ft. length of ⅛ in. sq. balsa, some carpet thread, a few match sticks and a khaki handkerchief. A white one would do, but it would then need to be 'camouflaged' by dyeing with water colour paint—a khaki one is ready to use and is readily available.

Figure one is a scale drawing of the hangar, to which you should refer when making all your measurements. Commence construction by making two ends from the grey card with tabs as shown for sticking to the baseboard. Both faces of these ends should be covered with pieces of handkerchief with the exception of the tabs. Allow the material to pleat in places to give a realistic effect. P.V.A. white adhesive was used throughout since it dries colourless and is quite 'matt' although balsa cement or any other strong glue would also be satisfactory.

Now, referring to Fig. 4, glue the ends to the baseboard. Notice that they slope slightly inwards. They are then connected by three pieces of ⅛ in. sq. balsa as in the upper sketch of Fig. 2. Steam the balsa to a slight curve before connecting the card ends.

The front of the hangar is of course left open and, in order to represent this, a strip of material ¾ in. wide is glued to the front piece of balsa and to the ends as in the lower sketch of Fig. 2. The cotton material is then gathered up in six places by carpet thread.

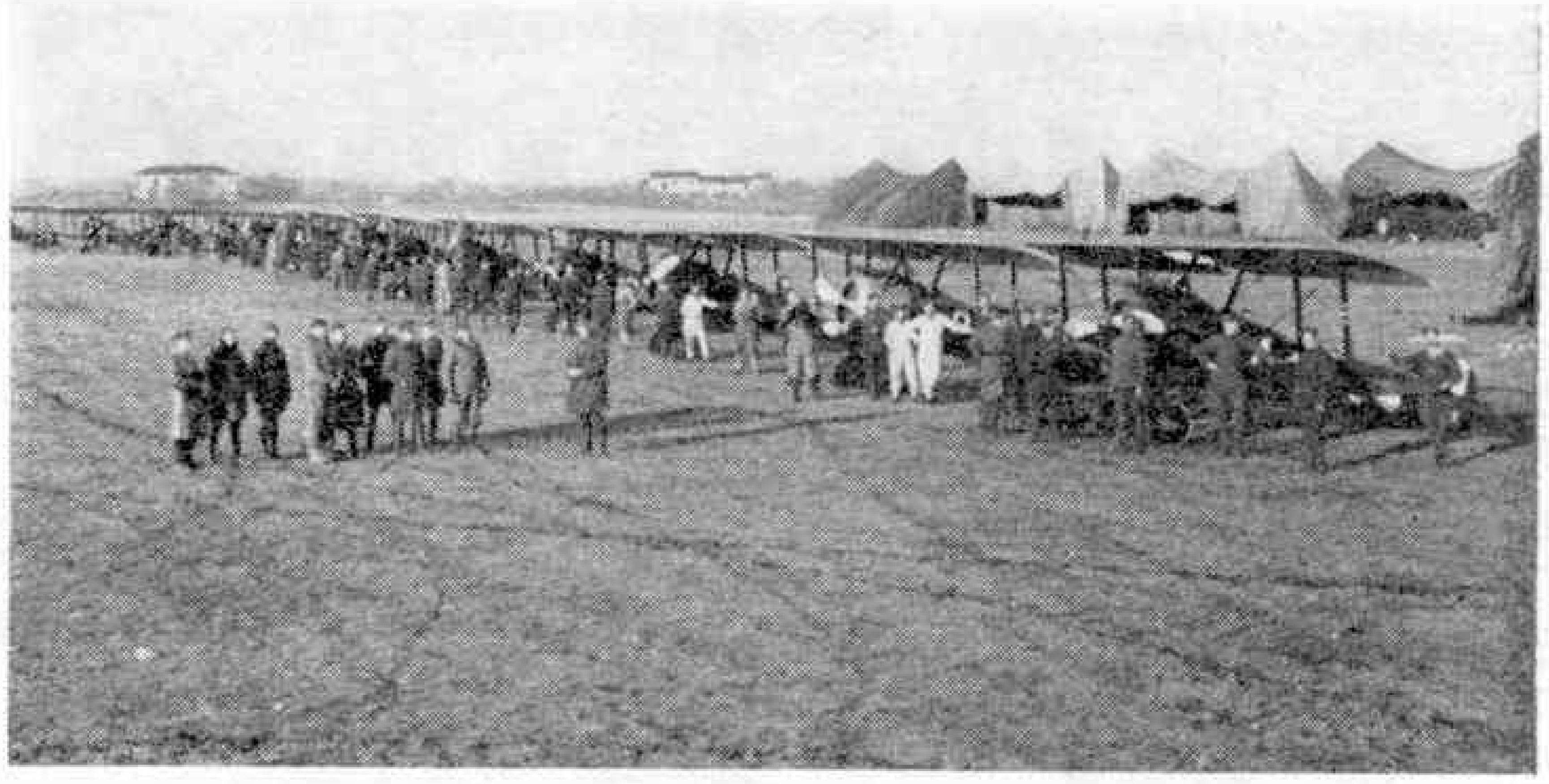
On active service these hangars would soon show signs of wear and tear, and it will enhance the realism of the model if we, too, give it a well-worn look. Fig. 3 shows how this can be achieved simply and effectively. First cut a piece from the handkerchief to cover the top and back of the hangar. Refer to the plan view again in Fig. 1 when making your measurements. This piece is then cut up again into three pieces; two for the roof and one for the back. In Fig. 1, notice the positions of the seams in the full size fabric. Obviously, in the full size hangar it was impossible to manufacture material to cover the entire length. To represent this in our model and also to simulate the change in colour of the various panels, powdered pencil lead or charcoal is rubbed on to the material with a piece of rag, using a scrap of card as a stencil as in Fig. 3. The real hangars might well have been patched and slashed with mud in places, so here again, careful use of a stencil can achieve a life-like effect. Another method of 'weathering' the material is by dipping an old toothbrush in water colour and splattering the fabric by drawing a razor blade over the bristles. Whatever method you employ, do not overdo it. Remember, the object is to achieve the effect of realism.

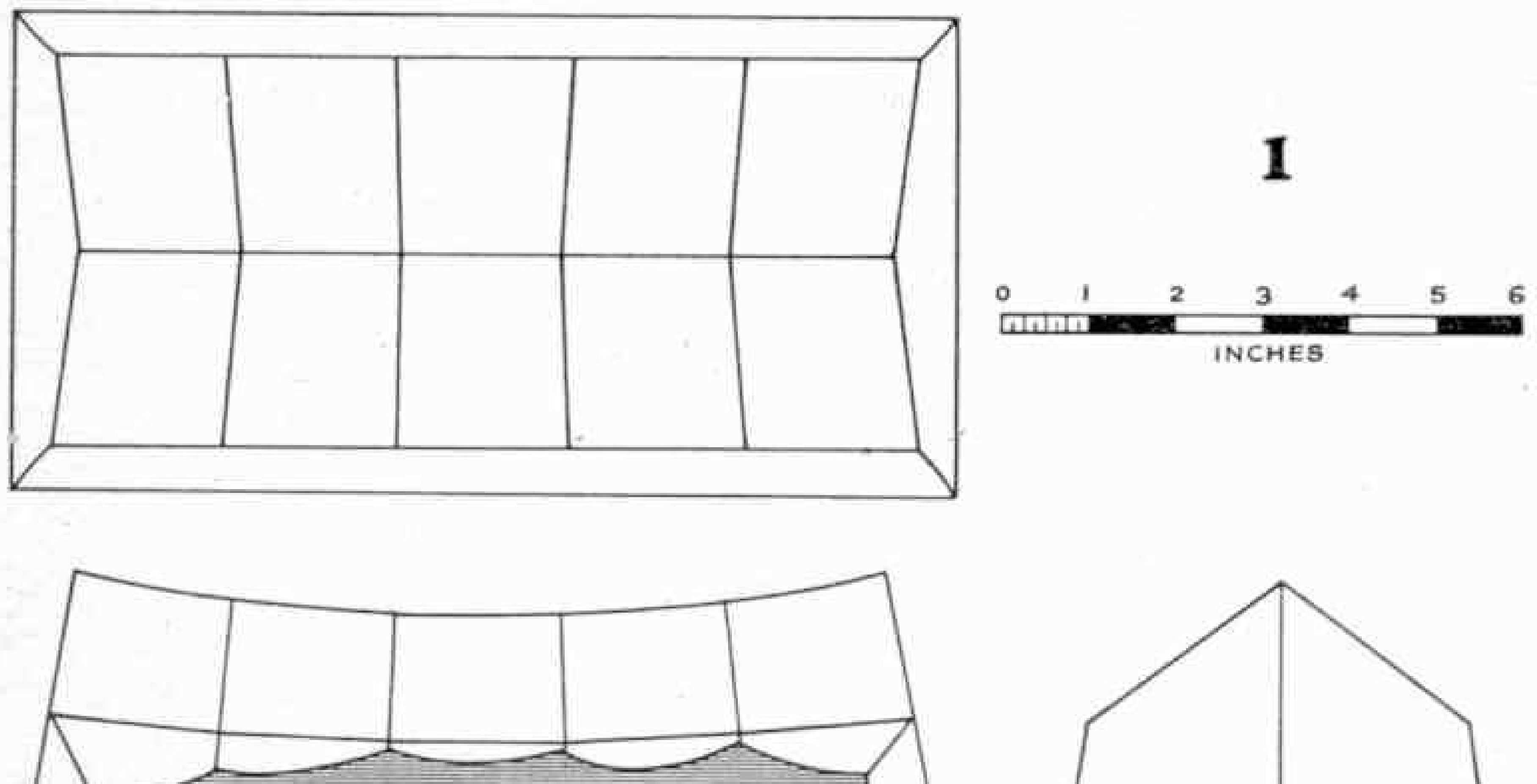
When the material has a suitably worn appearance attach it to the hangar frame as in the lower sketch of Fig. 2. If there are any gaps these can easily be covered with small scraps of material glued on. Strips of thin note paper, painted light brown to represent the seams in the canvas, are glued in place in the positions shown in Fig. 1. The strips should be $\frac{1}{16}$ in. wide. Your hangar is now complete with the exception of the guy ropes.

If you have not represented the texture of the ground on your baseboard with 'Polyfilla', as described in our first article, this should be done now. There is no need to apply the 'Polyfilla' right inside the hangar: as far inside as you can get with the top of a table knife will be sufficient. The baseboard should be painted earth colour. Poster colour is best for this purpose and also the least expensive. An oil colour hog's hair brush ¾ in. wide or even a piece of cotton wool will cover large areas quickly. When colouring your models, keep the colours dull, and follow natural hues as much as possible. In order to achieve the colour of earth, use burnt umber, yellow, black and white.

Allow the base to dry well before adding the guy ropes. Fig. 4 clearly shows their positions. They are made from lengths of carpet thread and first glued to the tent as shown, in pairs. While these are drying, drill twenty holes of $\frac{1}{16}$ in. diameter in the baseboard round the edge as indicated. Next make twenty 'tent-pegs' ⅜ in. long from match sticks and point the ends. Take each guy rope in turn to its appropriate hole (which should be filled with glue), and tap the guy rope in with a panel-pin hammer while the glue is still drying. If any of the guy ropes are still slack after everything has set, moisten them with water to tighten them up.

The whole squadron line up for the photographer! Farm buildings can just be seen on the field perimeter in the background, with a cluster of hangars nearer the camera. Note that the top of each hangar has a very pronounced sag. Plenty of activity has been going on, by the look of the wheel marks on the grass!





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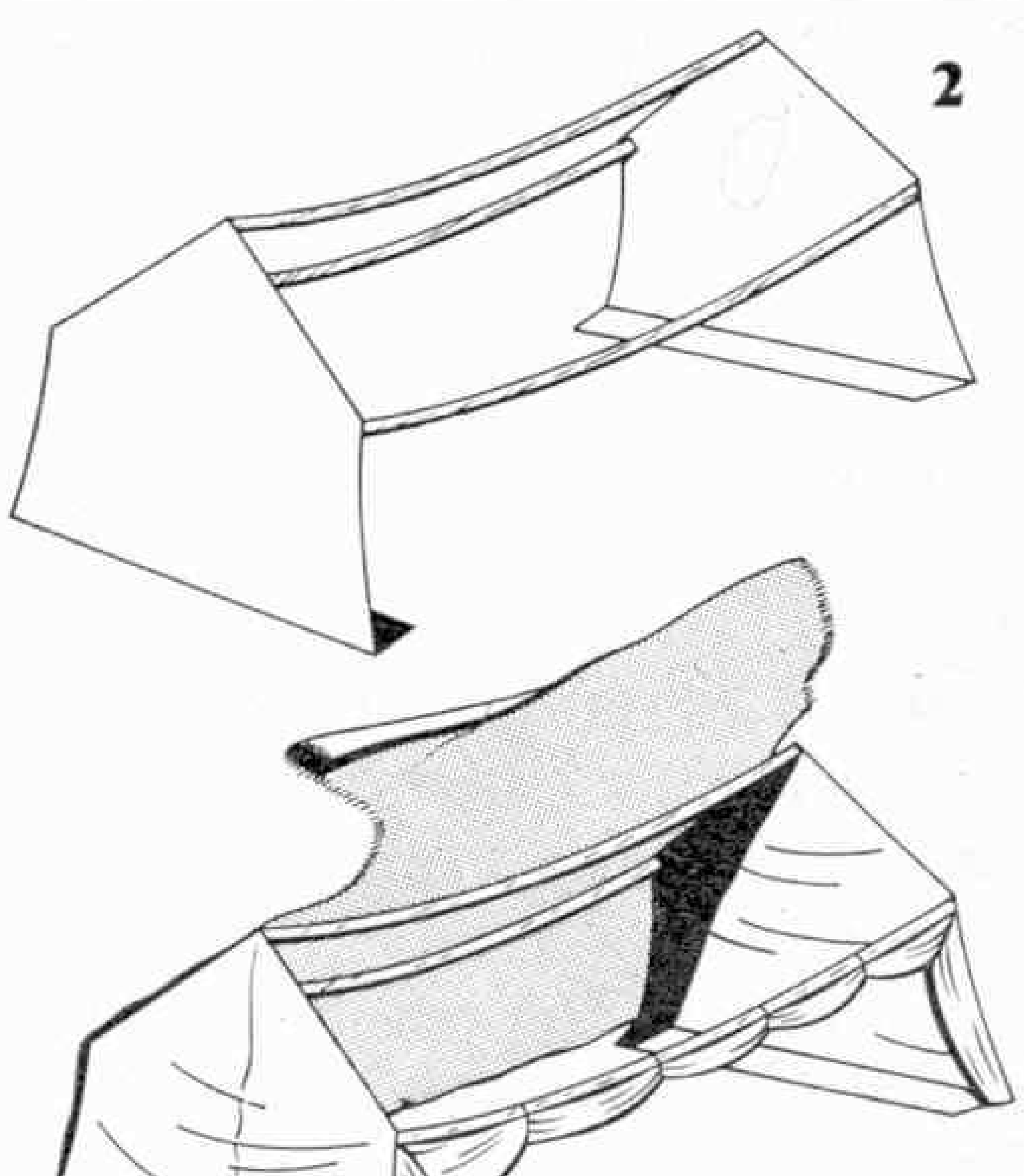

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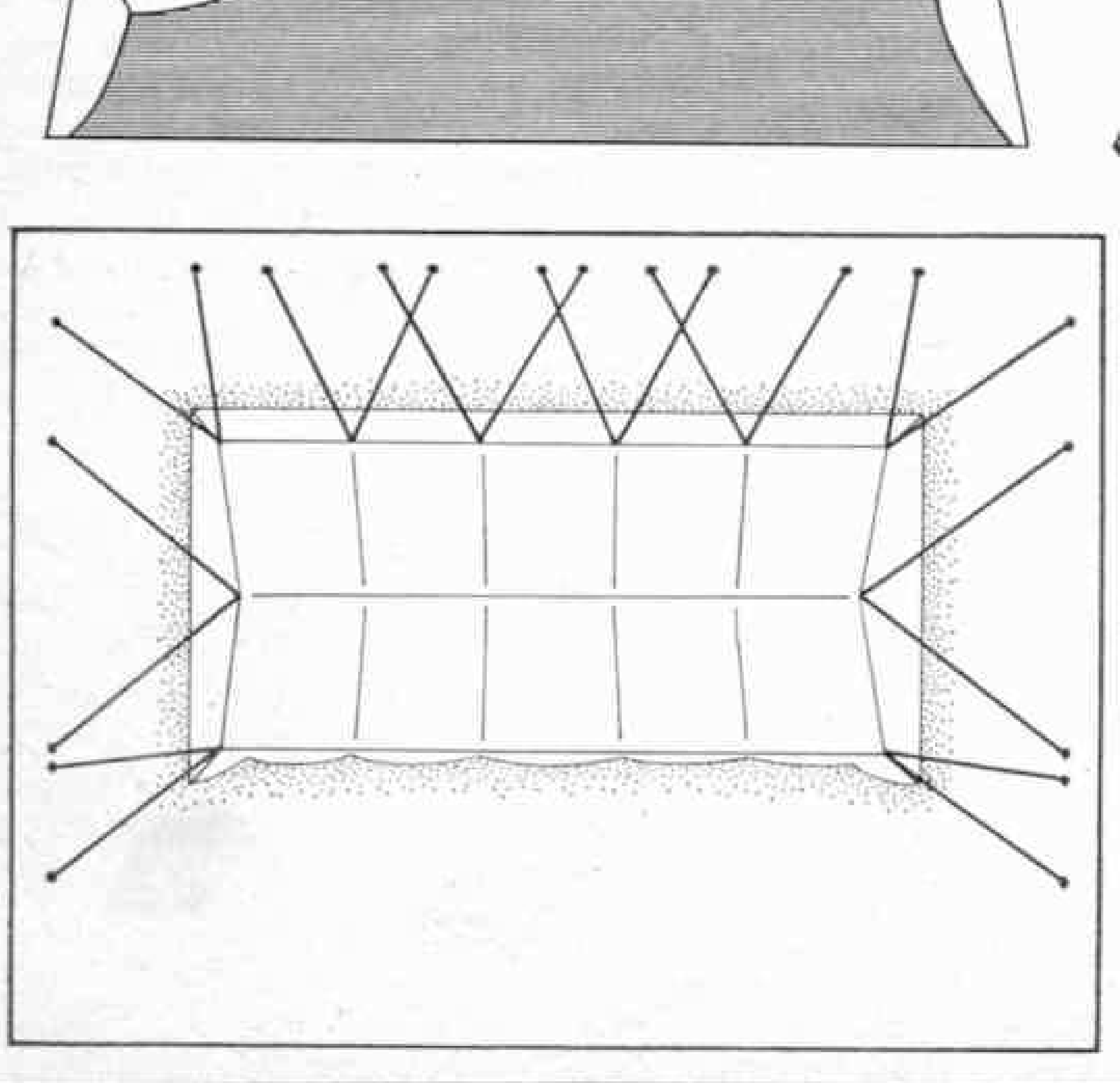

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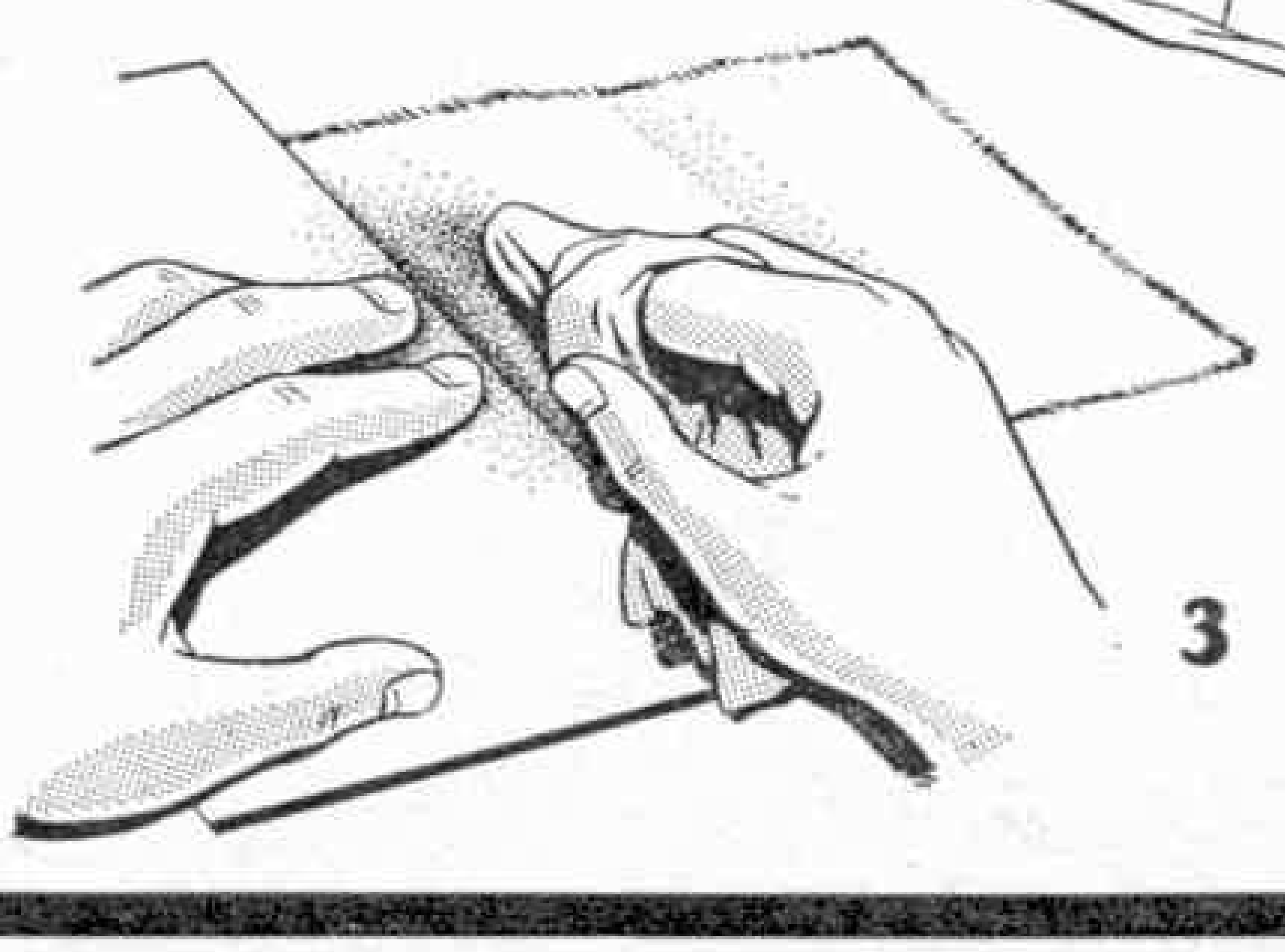

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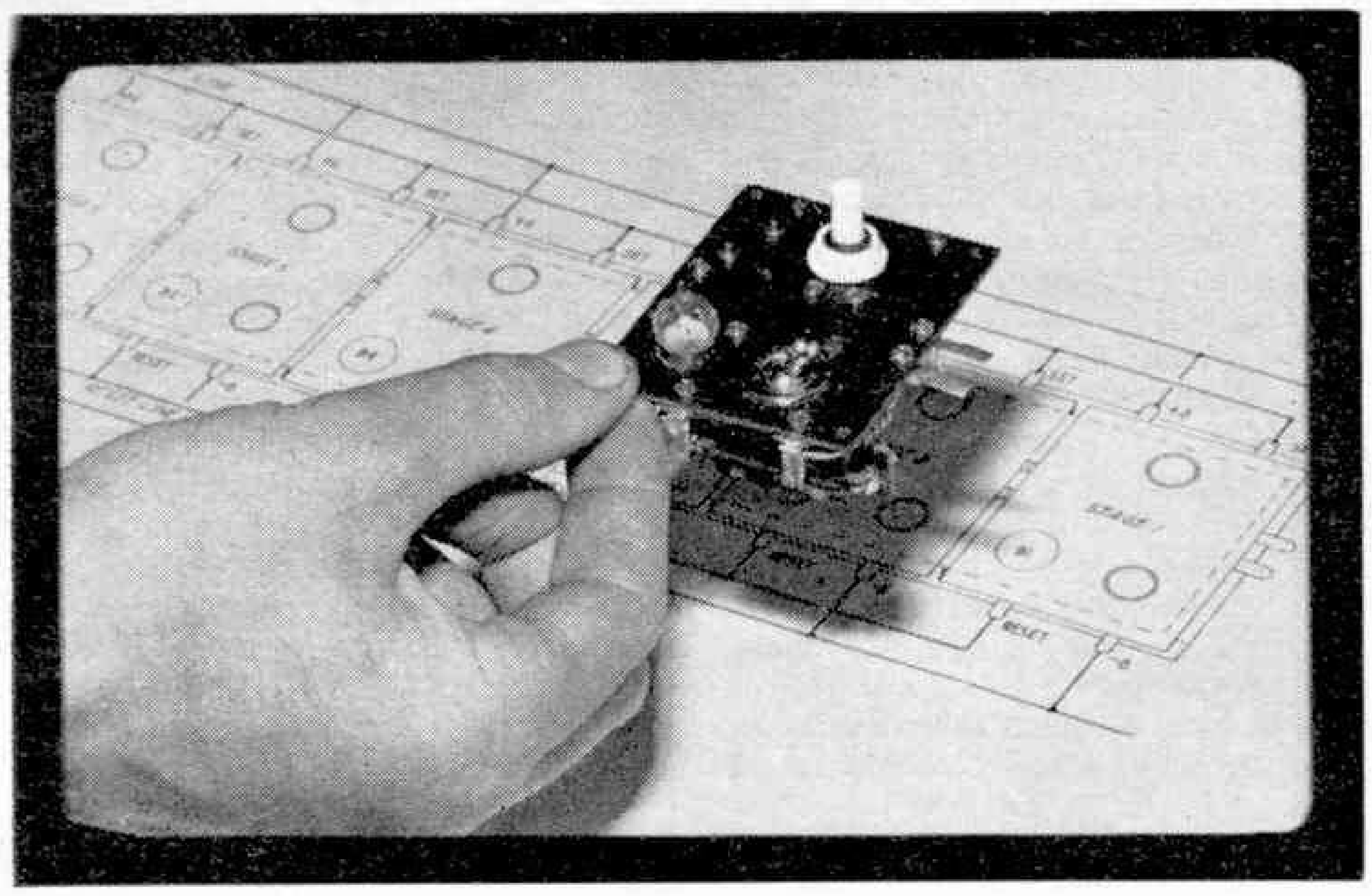


The Meccano Mag Computer

by Ron Warring

Although Computers play a large part in the everyday running of our lives, a great many people have never even seen one. But MM readers who are handy with a soldering iron can actually build one for themselves! Not as big as a commercial computer, of course, but the same in principle, with addition, subtraction, multiplication and division all within its capabilities. This, the first article in our computer series of four, deals with the construction of a single 'stage' or 'module'. Components can be obtained from a variety of shops in the Edgware Road area of London; we would particularly recommend H. L. Smith & Co. Ltd., 289 Edgware Road, W2. Tel. PAD 7595.

DON'T be misled by the fact that computers cost tens of thousands of pounds to buy and need special training to operate or 'programme' them. The basic element of a computer, known as the arithmetic unit, is quite a simple electronic circuit and if we forget about 'memory storage' and other sophisticated circuitry, it becomes quite easy to make an electronic computer with the ability to do addition and subtraction at lightning rate; and multiplication and division only a little more slowly. What is more you do not have to be an electronics expert either, and in this special design for *Meccano Magazine* we have broken down construction into simple step-by-step mechanical stages. The only special skill you need is the ability to use a soldering iron with reasonable proficiency to connect up the components.

First let us see what a computer's arithmetic unit actually does. Basically it is a unit which *counts*, either forwards for addition or backwards for subtraction; and it will do this as fast as numbers are fed to it. There is one important difference between 'computer counting' and ordinary counting, however. Whereas we normally count in tens and hundreds (or whatever other units are involved, such as pounds, shillings and pence), the computer counts in *binary* numbers or '0's' and '1's'. In other words, it works out addition or subtraction in terms of *binary arithmetic*.

There is no need to worry any more about this at this stage. We will explain how to work with binary numbers later on, but we have mentioned it here to explain the significance of the number of *stages* in a computer. A *single* stage of a binary counter can only count up to 1. The addition of a second stage will extend the counting ability up to 3; a third stage will extend the count up to 7; a fourth stage will extend the count up to 14.

The important thing is that each stage is identical—exactly the same in circuit design and construction—and represents a very simple item to construct. By building a number of identical stages and connecting them together the counting ability of the computer goes on increasing without making the construction any more complicated. The only snag is that the cost goes on increasing as even reducing the number of components required for a stage to a minimum in our design, each stage you build requires three transistors, three diodes, nine resistors and four capacitors, plus two switches and a bulb. You will have to decide how many stages you can afford for a start. You can always add more stages later on to increase the counting ability of your computer.

To help you decide, the following table gives the total count available with different number of stages. This 'total count' represents the greatest number which can be fed into or recorded by the computer.

number of stages	total count
1	1
2	3
3	7
4	14
5	31
6	63
7	127
8	255
9	511
10	1023

For a simple demonstration model three or four stages are adequate. For a useful working computer we would recommend you aim for six or seven stages; and if you can eventually add on to build up to a ten stage job you will have a computer with a working range of just over 1,000.

Remember, as we have said, it does not make the computer any more *complicated* to increase the number of stages—only more costly. All you have to do is decide how many stages you want to have, or can afford, and then build that number of single stage units (or modules) complete. The remainder of this article describes the construction of a single stage in detail. The next article will show how single stages are linked to make a complete computer.

The circuit diagram of a single stage can be ignored as far as building is concerned, except that it is a useful reference for checking that the wiring up is correct. To assist in this respect it is laid out as it would appear on the underside (component side) of the mounting panel. You can thus trace connections through referring directly to the circuit diagram. Don't worry if you cannot 'read' circuit diagrams. Just ignore it and concentrate on the step-by-step instructions.

First obtain all the necessary components as per the component list, remembering that you want a complete set of these components for *each* stage you intend to build.

Step 1 (Fig. 1)

Cut out a $2\frac{1}{2}$ in. by $2\frac{1}{2}$ in. panel from sheet Paxolin ($\frac{1}{16}$ in. or $\frac{3}{32}$ in. thick). Then either cut out Fig. 1 and paste onto this panel as a pattern, or trace Fig. 1 onto the panel.

The three large circular cut-outs should be made first to fit the switches being used, and to take the base of the 6 volt bulb. The latter should be large enough to pass the base of the bulb, allowing the glass part of the bulb to rest on top of the panel.

All the black dots are then drilled out with a $\frac{3}{32}$ in. drill. The four shaded holes (one in each corner) are drilled out with a slightly larger drill to take a convenient size of small woodscrew. These corner holes are fixing points for assembling the individual stages on the final computer frame.

Step 2 (Fig. 2)

Turn the panel over and mount—

(a) eight flat terminal tags in the positions shown.

(b) four 'pillar' tags in the positions shown

(c) Three 8 BA brass bolts and nuts where shown, with the shanks of the bolts protruding on the same side as the tags.

Note that the tags can be fastened with small rivets, or eyelets; or if you find it simpler, with 8 BA brass screws and nuts, cutting off surplus length of screw.

Step 3 (Fig. 3)

Turn the panel the other way up (tags underneath) and fix the two switches in position. The bulb is simply passed through the hole in the panel and then secured with a rubber band around the base of the bulb, or a strip of cellulose tape, or a spot of Bostik adhesive.

Step 4 (Fig. 4)

Turn the panel upside down once more. Solder a length of insulated wire between the 'O' and 'O' tags, as shown. Use short lengths of insulated wire to connect SW1 terminals to the 'IN' and 'SET' tags. Similarly, connect the two outer terminals of SW2 to the two bottom pillar tags. (A and B)

Use a further length of wire to connect the −6V tag to one terminal on the bulb base.

Solder diode D1 between pillar tag D and bolt F.

Solder diode D2 between pillar tag C and bolt E.

Solder diode D3 between the centre terminal of SW2 and the 'OUT' tag.

Step 5 (Fig. 5)

Now solder in all the resistors in the circuit.

R1 between 'RESET' tag and B
R2 between B and C
R3 between D and '+6V' tag
R4 between A and '−6V' tag
R5 between A and D
R6 between C and '+6V' tag
R7 between A and E
R8 between B and G
R9 between B and F

Step 6 (Fig. 6)

Now add the four capacitors, soldering in place and noting the correct polarity of C1 and C2.

C1 between B and C (plus side to C)
C2 between A and D (plus side to D)
C3 between F and terminal of switch SW1 connected to 'IN'
C4 between E and terminal of switch SW1 connected to 'IN'

Step 7 (Fig. 7)

Finally solder the three transistors into the circuit, taking great care to identify the transistor leads correctly (see small diagram).

*TR*1—collector (C) goes to B
base (B) goes to D
emitter (E) goes to 'O' tag
*TR*2—collector (C) goes to A
base (B) goes to C
emitter (E) goes to 'O' tag
*TR*3—collector (C) goes to the other terminal on the lamp base
base (B) goes to G
emitter (E) goes to 'O' tag

This completes the wiring up of the stage. You can check it for working by wiring up temporarily to a 6 volt battery as shown in Fig. 8. Don't bother to solder the wires to the tags, just twist them in place sufficiently to make good contact.

When connected as shown the lamp should be off. If not, remove the wire from the 'RESET' tag (when the lamp should go out) and then replace it. If not, move SW2 to its other position. Each momentary operation of switch SW1 should then, alternately, make the lamp light up and go out. This indicates that the stage is working correctly and 'counting' 0,1,0, etc., following in-out signals given by operating switch SW1. If the stage does not work properly, check back through all the connections to see if one component is wrongly positioned (preferably using the circuit diagram as a guide).

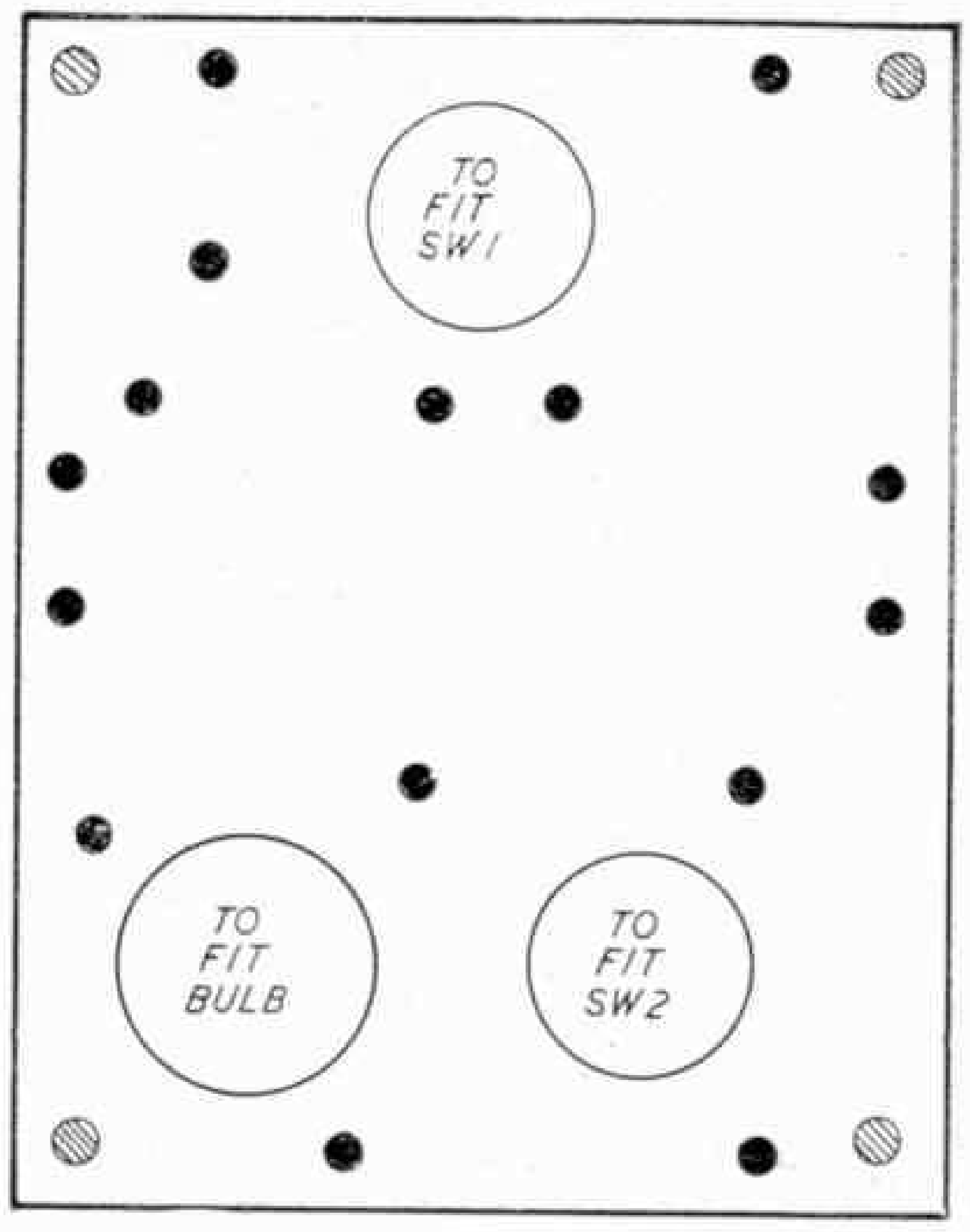
Build all the stages you require and check each out for working, ready for assembly into a complete computer next month.

Components

Resistors:
R1 1 kilohm
R2 4·7 kilohm
R3 220 kilohm
R4 1 kilohm
R5 4·7 kilohm
R6 220 kilohm
R7 220 kilohm
R8 6·8 kilohm
R9 2·2 kilohm

Capacitors:
C1 6·4 microfarad
25 v working electrolytic
C2 6·4 microfarad
25 v working electrolytic
C3 0·22 microfarad
C4 0·22 microfarad

Figs. 1 and 3 full size



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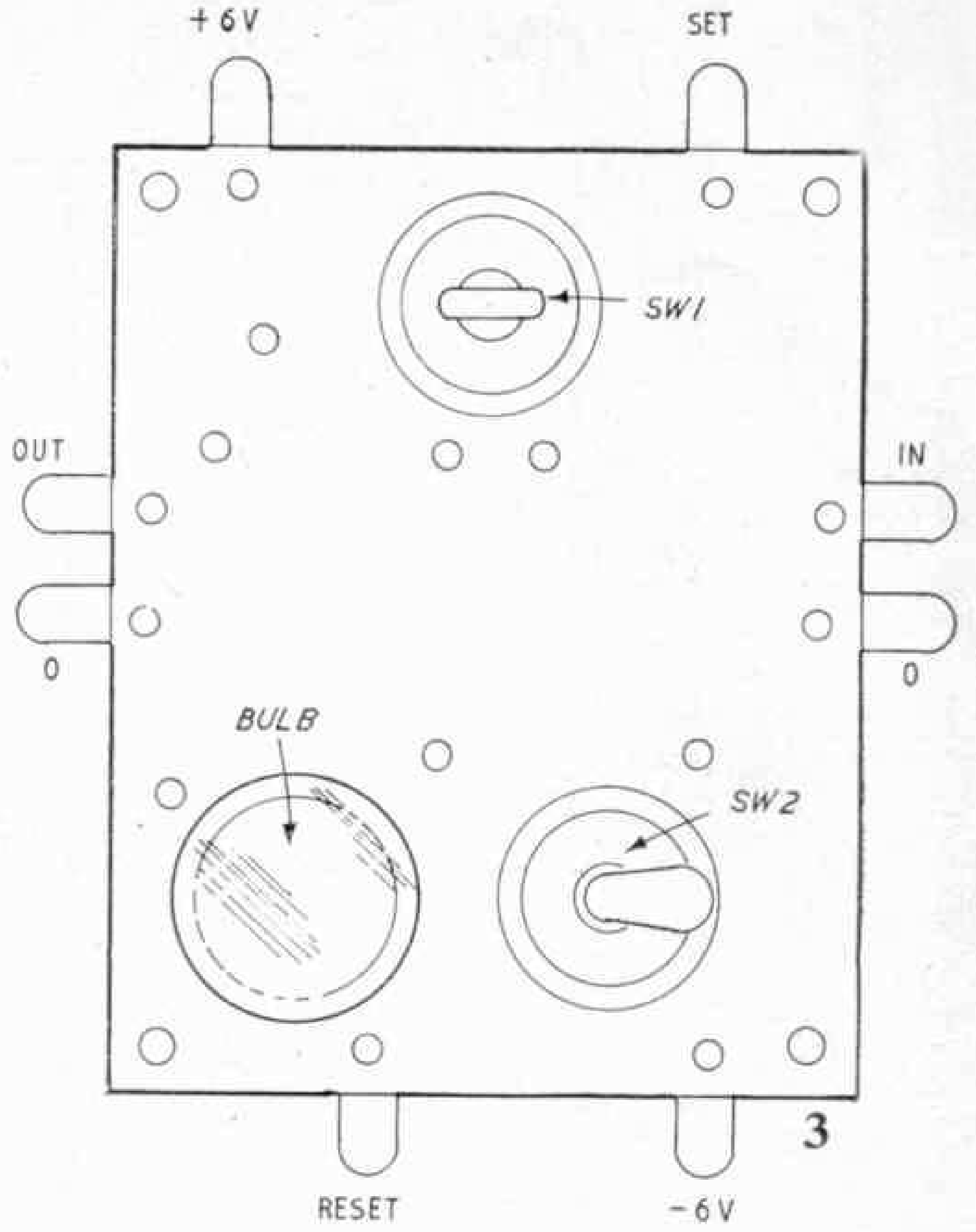

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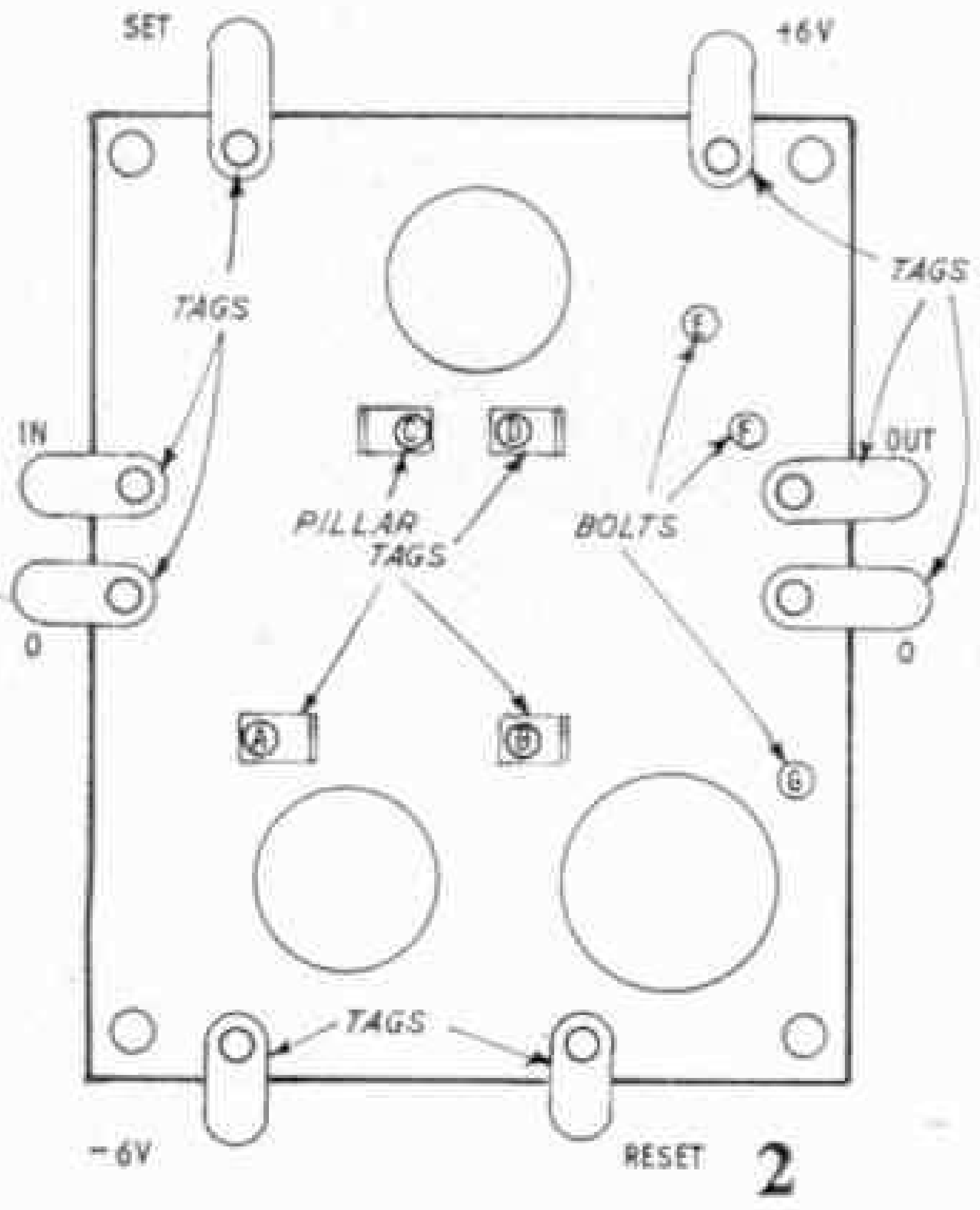

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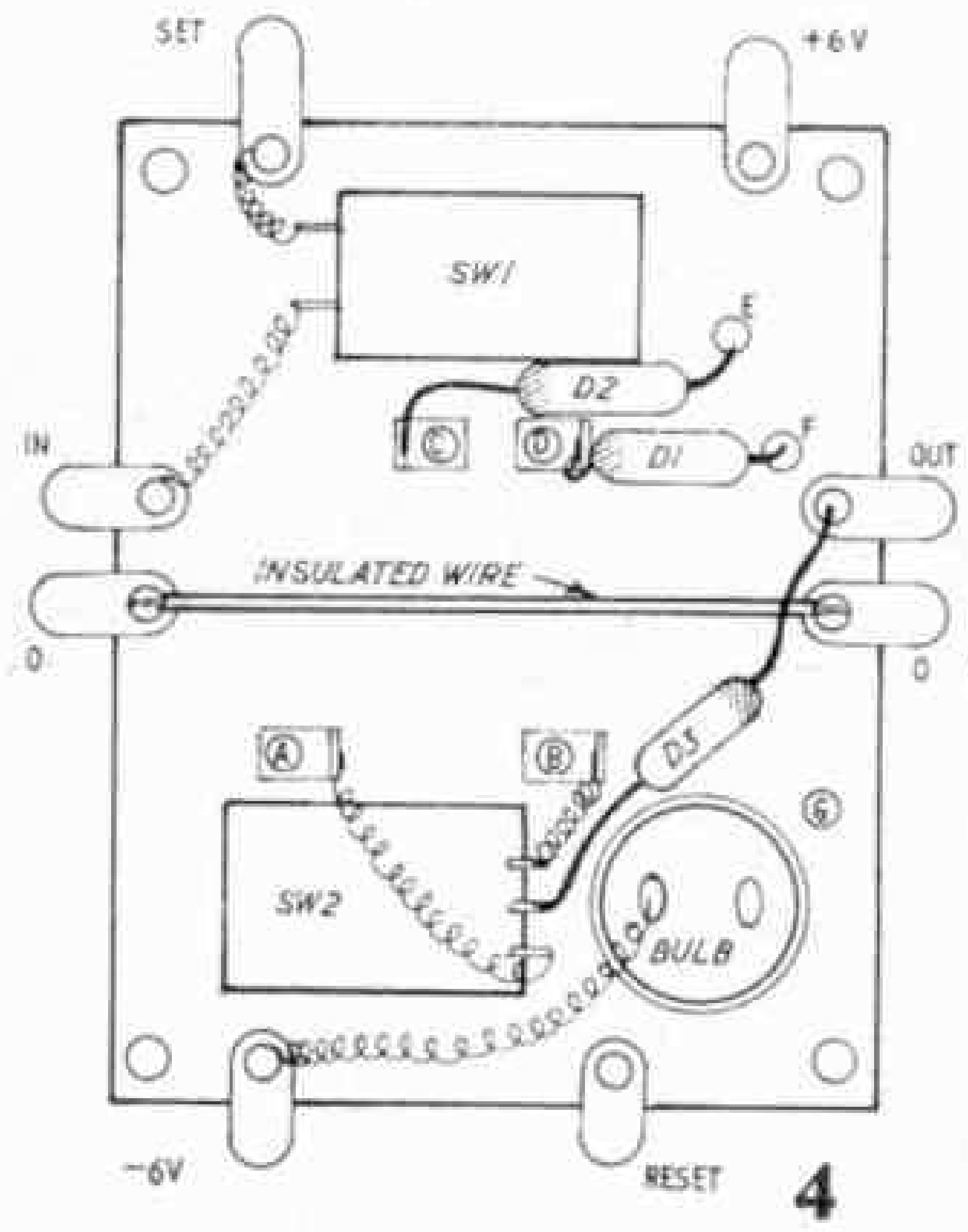

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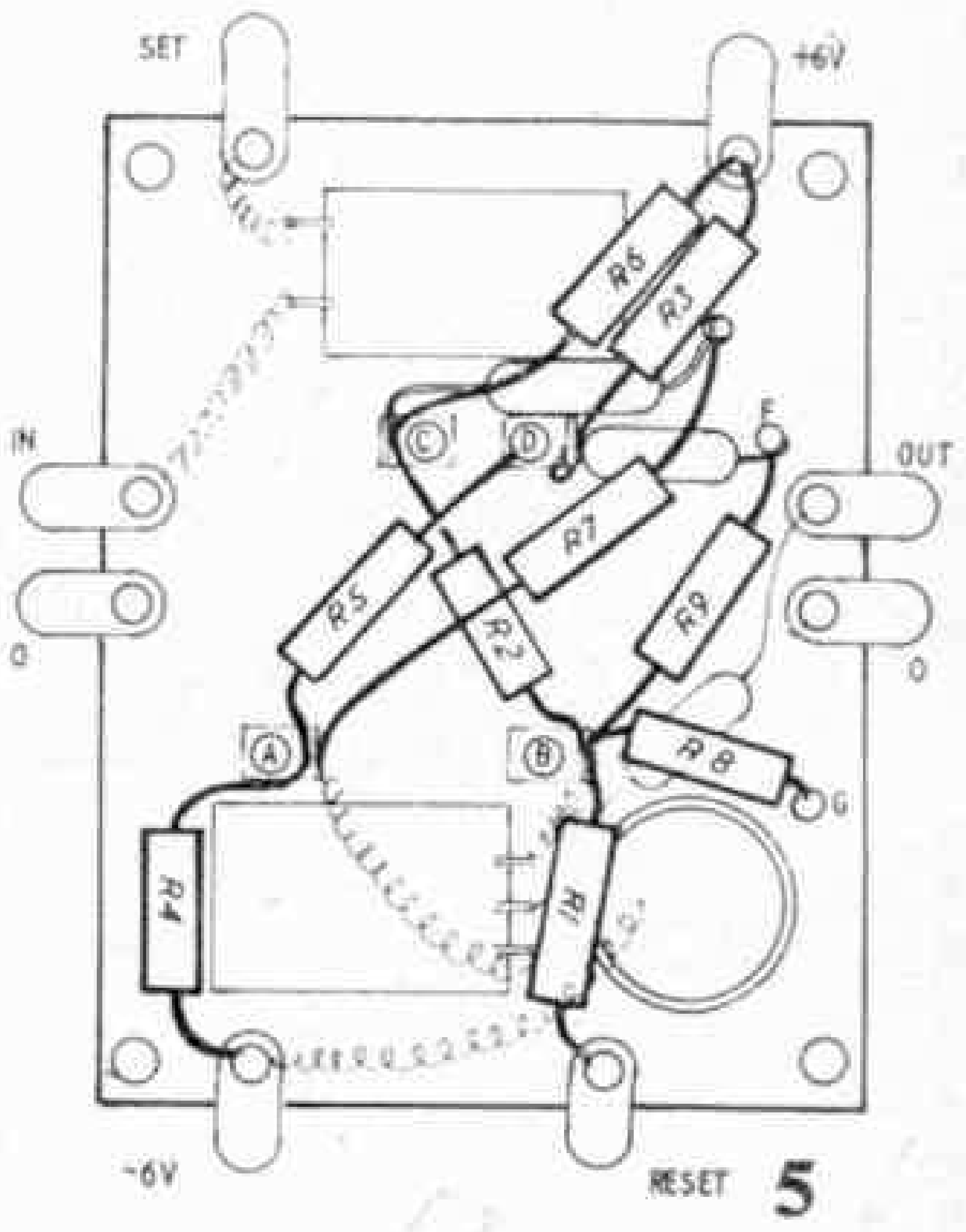

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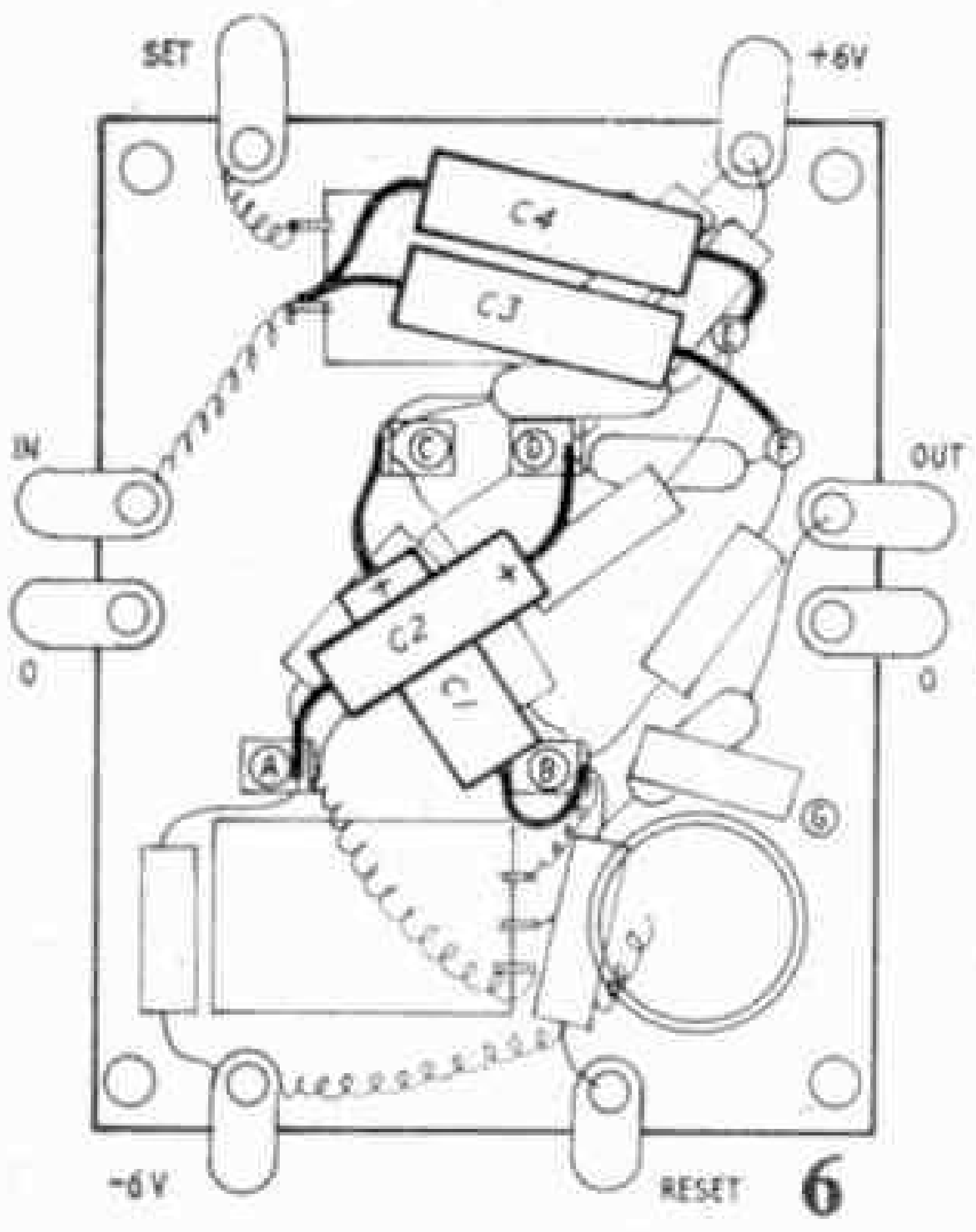

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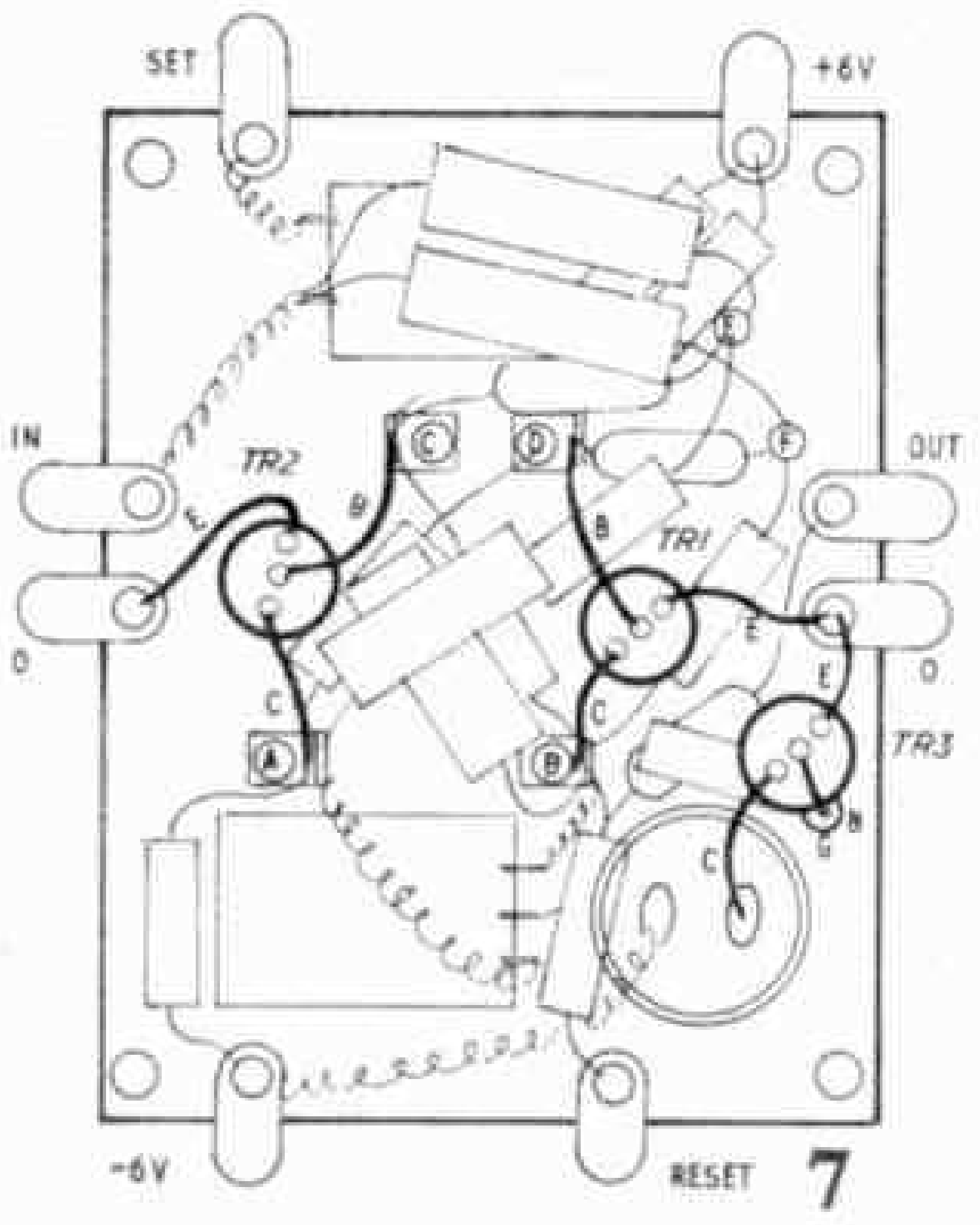

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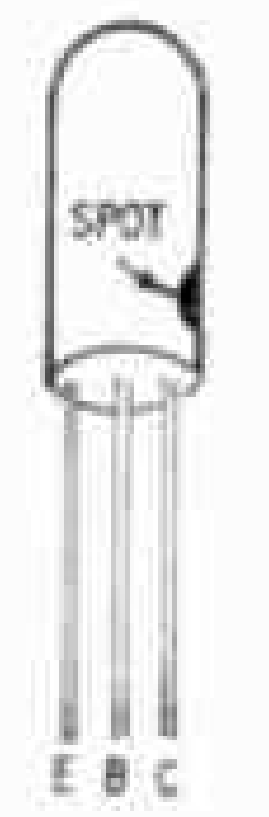

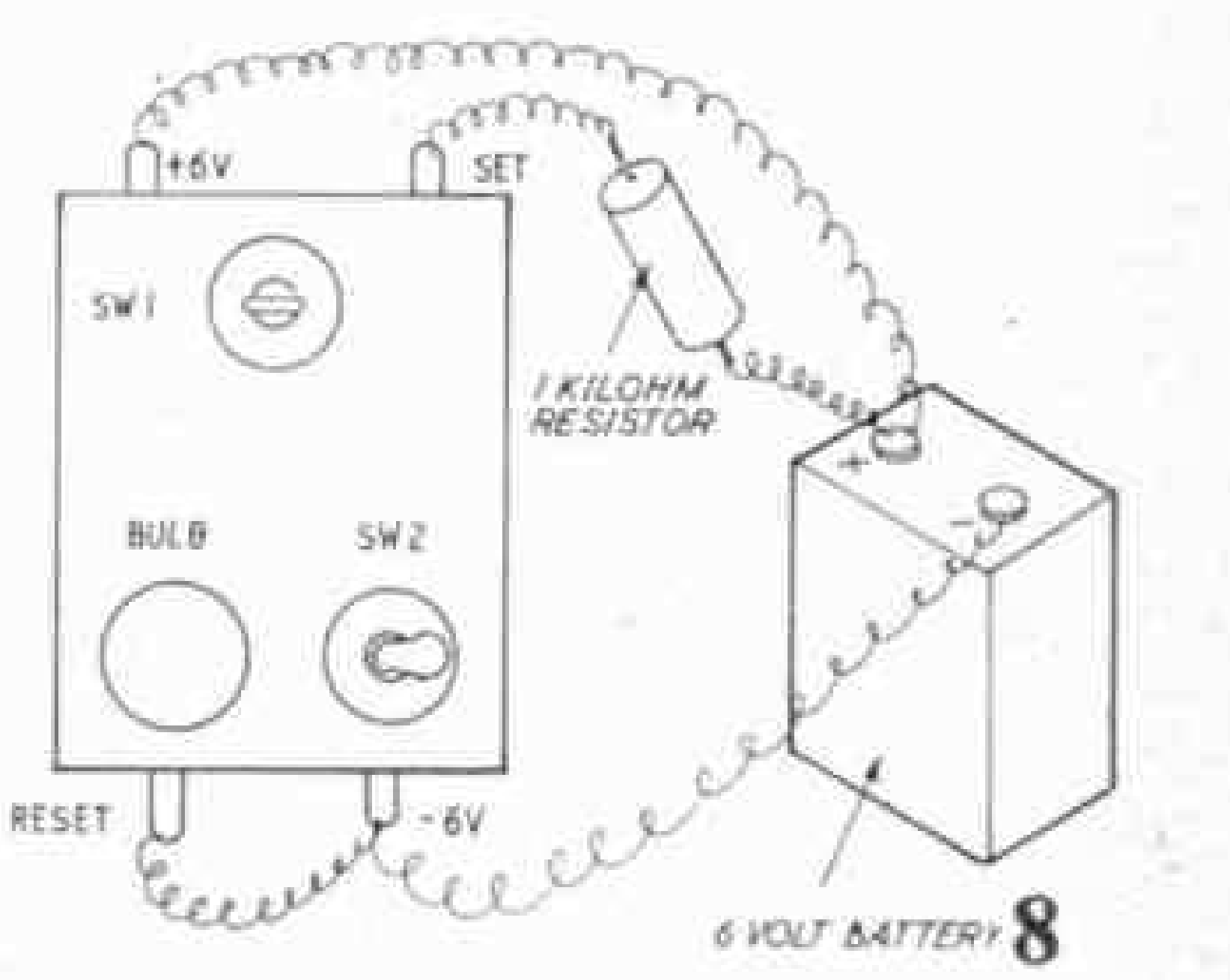

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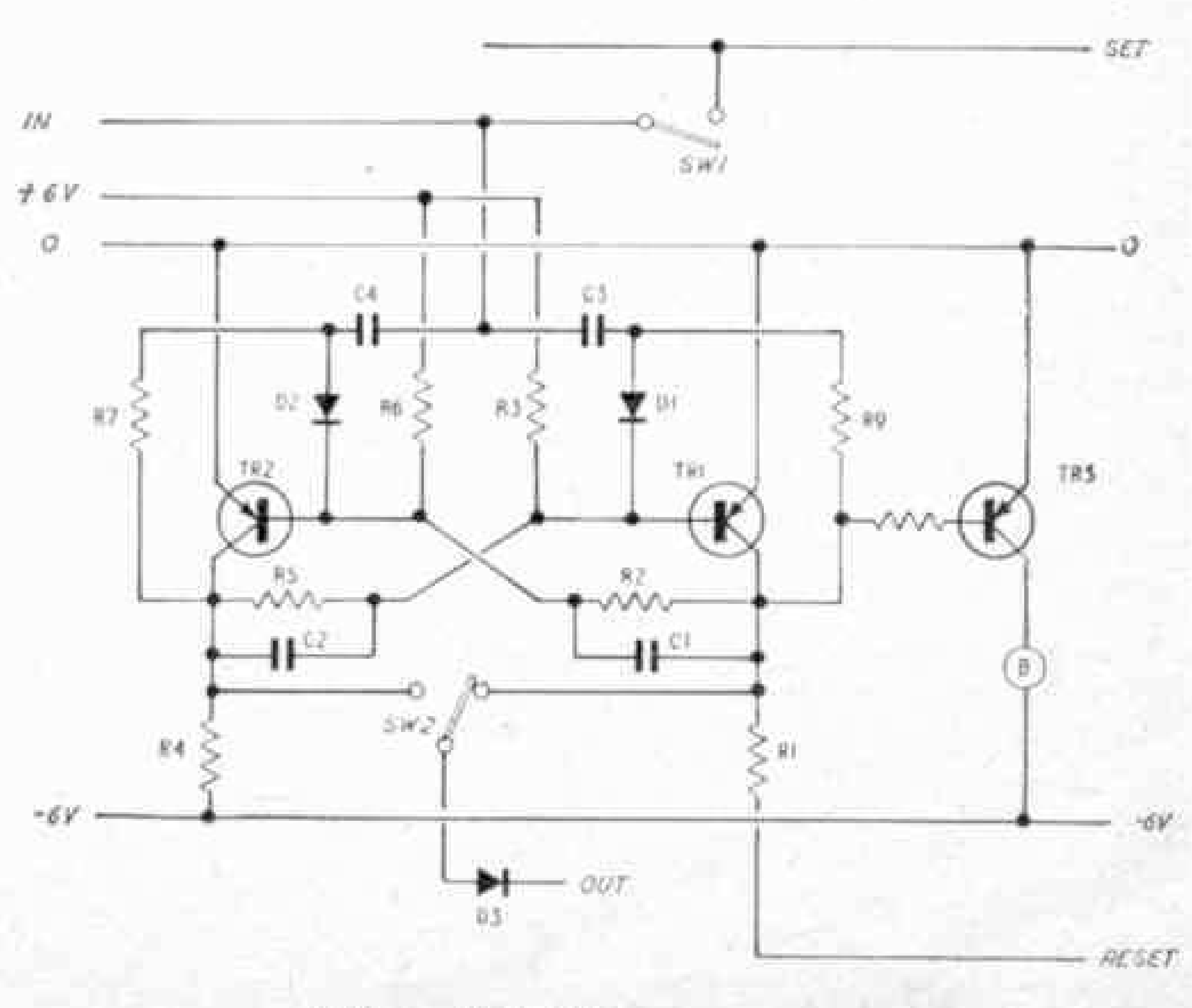
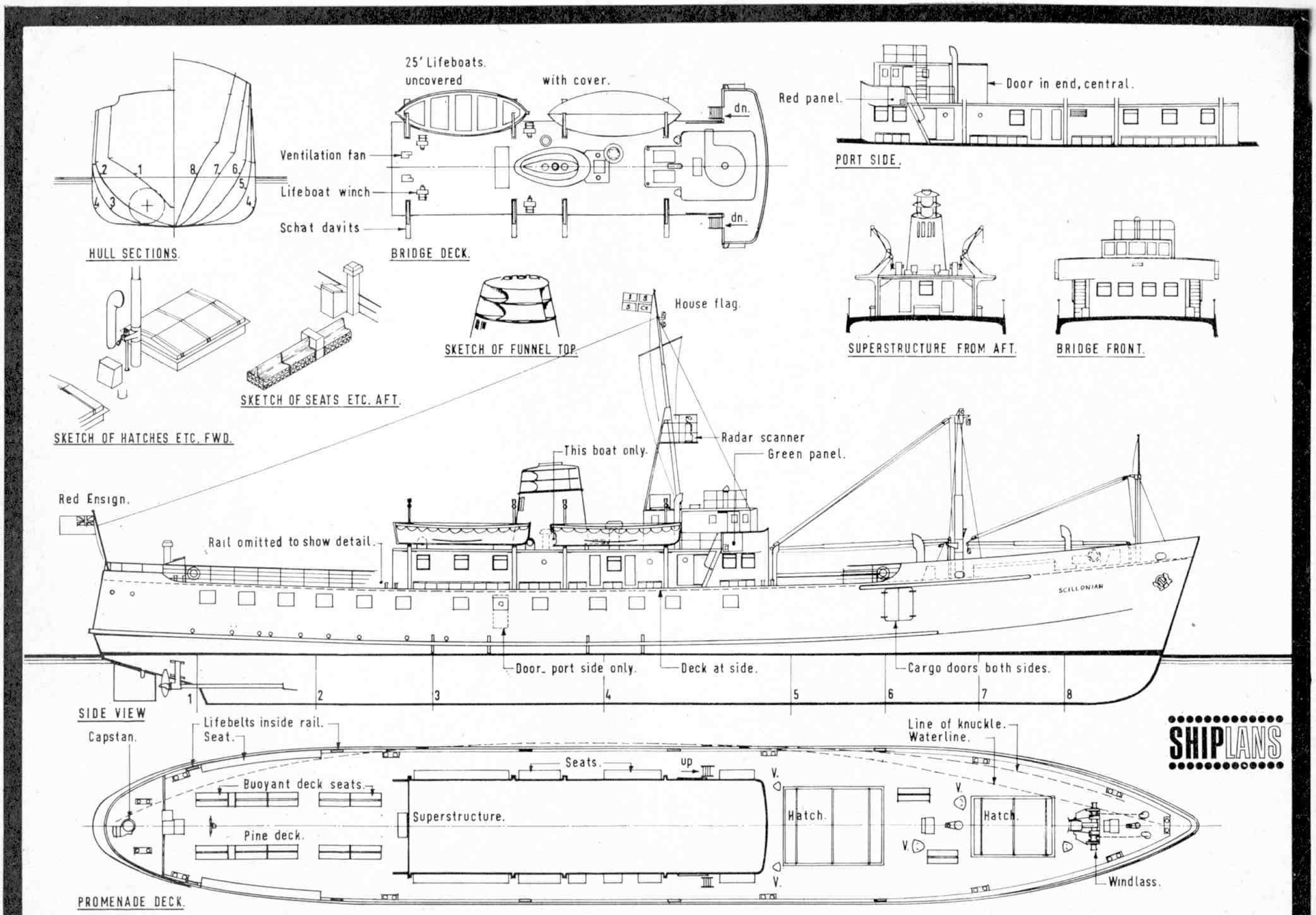
Diodes:
D1, D2 and D3 Mullard OA85 (or OA81)
Transistors:
TR1 Mullard OC71 (or equivalent)
TR2 Mullard OC71 (or equivalent)
TR3 Mullard OC71 (or equivalent)
Bulb: B 6 volt 0·05 amp
Switches:
SW 1. Single pole toggle switch *biased to break* (or you can use a pushbutton switch)
SW 2. Two-way switch
Paxolin panel: size 2½ in. by 2 in.
Terminal tags:
8 straight
4 right-angled ('pillar' tags)
Bolts: three 8 BA approx 1 in. long, with nuts
Eyelets (or rivets or 8 BA bolts) to mount tags—12 required
Insulated wire for connections: approximate 12 in.

All resistors ¼ watt 10% tolerance



Circuit Diagram



"SCILLONIAN"

PASSENGER_CARGO SHIP. PENZANCE _ST. MARY'S SERVICE.
ISLES OF SCILLY STEAMSHIP CO. LTD.

DRAWN BY IAN R STAIR.

R·M·V· SCILLONIAN

Passenger and Cargo Ship

THE 'Scillonian' is known to many thousands of people who have visited the Isles of Scilly. An even greater number will have seen her when on holiday in the West Country. The ship model makers among them, must have noticed what an excellent subject she would make as a working model. The high freeboard would make for a dry 'ship' and the simple shape of the superstructure would be quite robust for pond side handling. The superstructure, when removed, would give enough access to the inside of the hull without having any of the deck removable.

If built four times the size of the accompanying drawing the length would be just under three feet and the scale 1/72. At this scale it could also be a 'scenic' addition to a model railway harbour and be peopled with '00' passengers and crew. As a waterline model the hull shape would permit it to be built in the manner of lineside architecture.

If these projects do not appeal to you the 'Scillonian' would make a delightful little model to the scale of the drawing. Construction could be mainly of card covered balsa. The card gives a sharper appearance and is easier to finish than balsa wood. Also the windows can be cut out cleanly in card, the odd door should be cut out and glued back in the 'open' position as this gives life to the model.

Despite her smart modern appearance the 'Scillonian' is not a really new ship. She was built by John I. Thornycroft and Co. Ltd., at Southampton, for the Isles of Scilly Steamship Co. Ltd., and entered service in 1956 in time for the summer season.

The 'Scillonian' is 208 ft. 6 in. long and 30 ft. 9 in. beam with a gross tonnage of 921 tons. She was built especially for the service between the mainland and the Isles of Scilly replacing a ship of the same name.

The trade on this run is mainly summer holiday tourists and the flower and potato harvest from the islands. The passenger accommodation is aft on the main deck, which has good natural lighting from the large windows in the hull and on the promenade deck. There are pleasant lounges and a bar in the superstructure amidships. There is also a saloon on the lower deck just aft of the engine room. Total capacity is 500 passengers. Cargo is carried forward and in addition to the usual hatches double doors are provided in both sides of the hull and on the main deck. The winches for the two derricks are on the main deck which leaves the promenade deck clear of machinery except for the windlass forward and the capstan aft. All are electric. The absence of machinery is a good feature on a ship which carries a large number of passengers on deck at the height of the season.

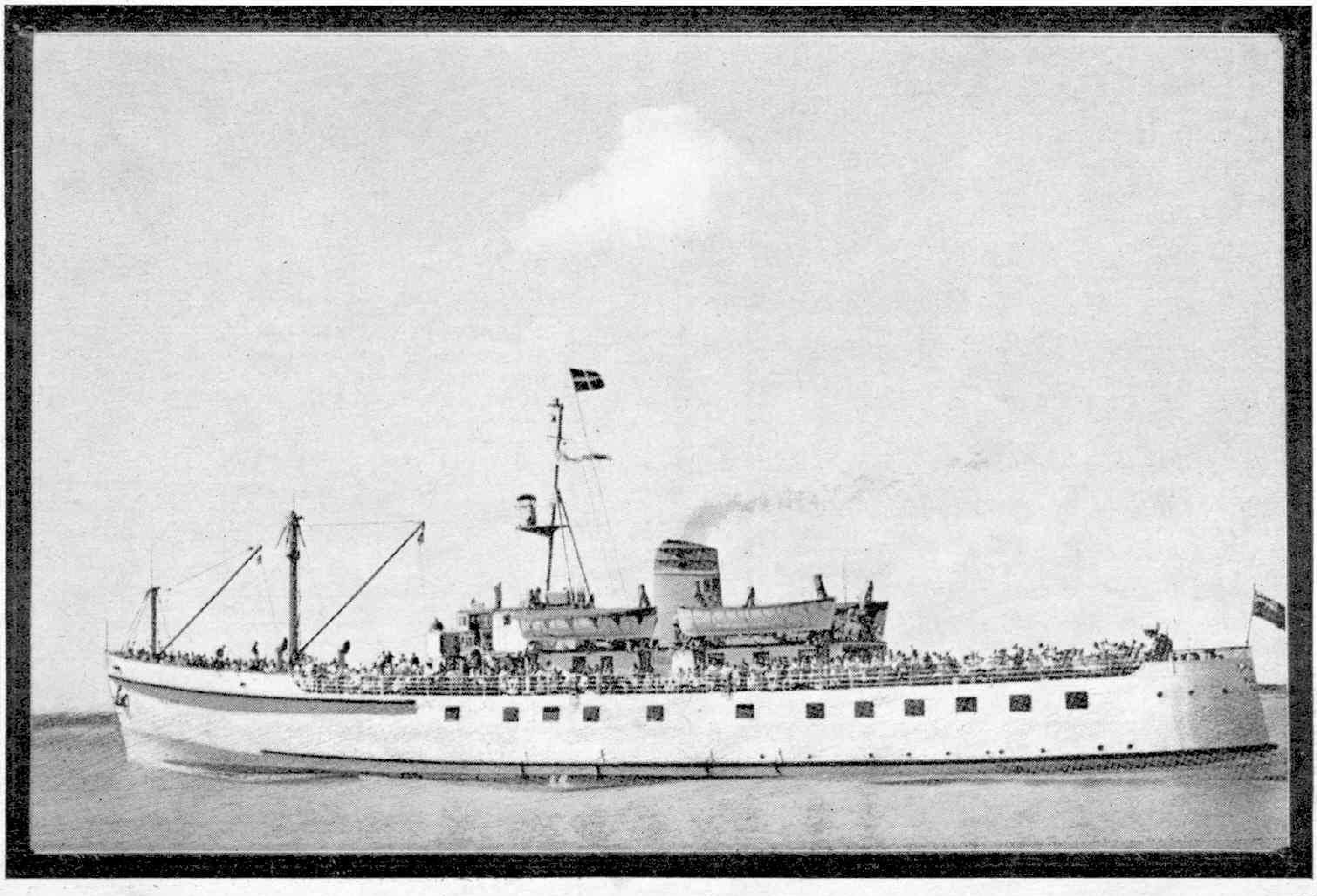
The two main engines are by Ruston & Hornsby of Lincoln. They are six cylinder four-stroke diesels of 720 h.p. each. The bore is 12½ in. and the stroke 15 in. They drive three bladed propellers 6 ft. 8 in diameter. A speed of 15½ knots was attained on trials.

Four 25 ft. lifeboats are carried on the bridge deck. One is fitted with manual propelling gear. In addition there are a number of buoyant deck seats plus the usual lifebelts. As a precaution against fire a number of fire-resisting bulkheads are fitted and the openings in these are equipped with fireproof doors. The passenger and crew accommodation is protected by a sprinkler system in addition to the usual fire fighting equipment.

Colours and details for a model:

Hull—White topsides with green boot topping. Decks—Oregon pine, the promenade deck has a 9 in. wide waterway at the sides painted black. Hatches—Light grey with green covers. Name, masts, ventilators and funnel—yellow buff. The cowl vents have blue mouths. The superstructure is white, the windows having dark hardwood frames. The rail round the promenade deck and bridge front is hardwood, Iroko. The lifeboats and their winches can be shown with 'canvas' covers. If they are modelled without there is a dark brown top strake to each boat. The house flag is dark blue with a white cross and red letters.

The author wishes to thank the Isles of Scilly Steamship Co. Ltd., for their help in supplying details for this article and drawing.



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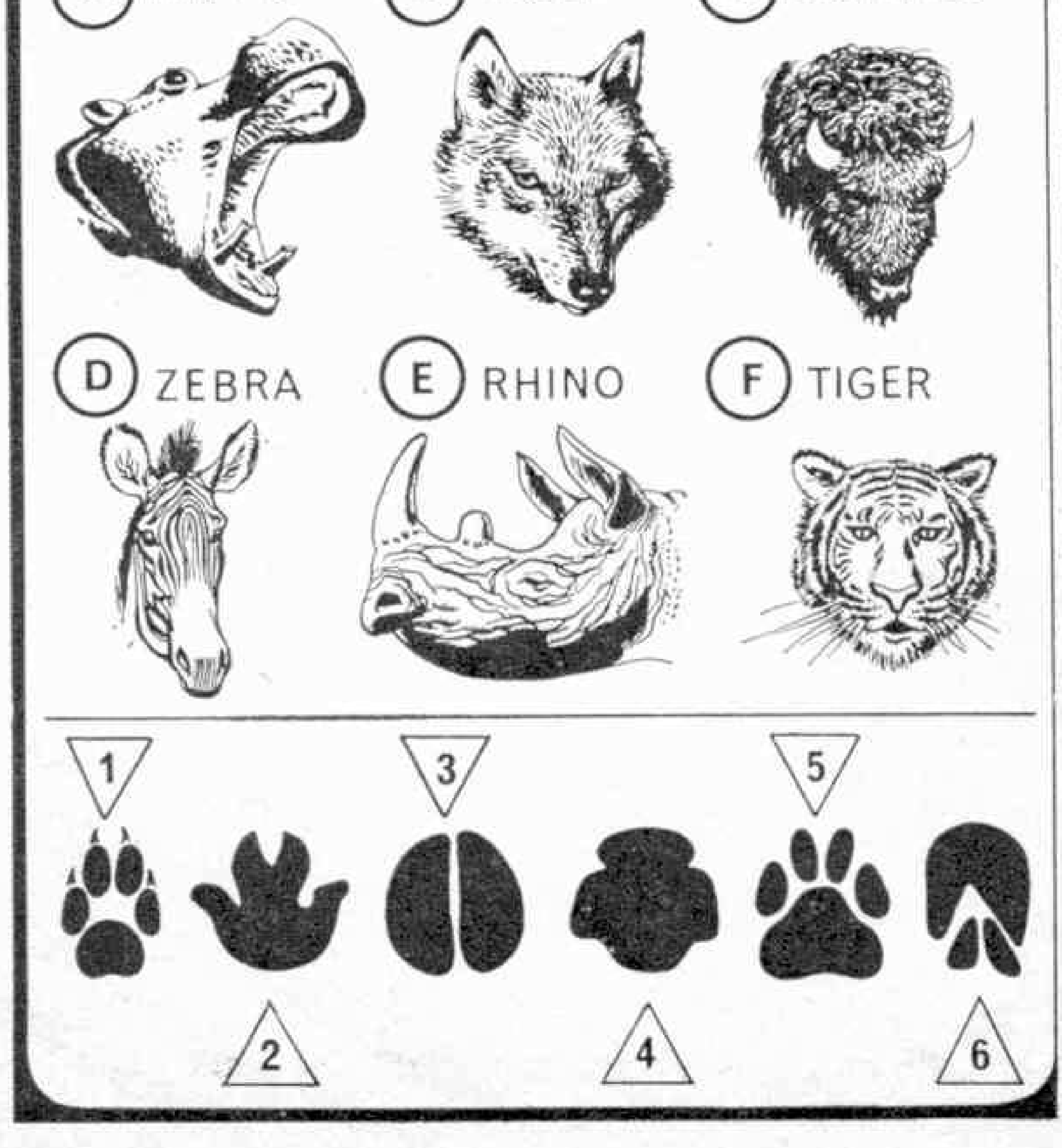

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B					
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D					
E					
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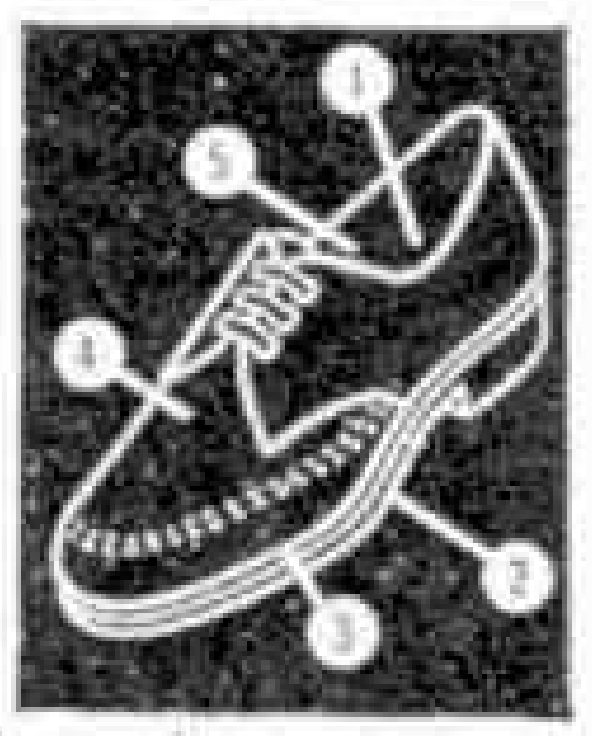
2. All entries will be examined, and the 25 first prizes of bicycles will be awarded to the competitors who have correctly matched up the animals with their tracks, and who have, in the opinion of the judges, most aptly and convincingly completed the unfinished sentence. The 50 prizes of Scalextric Racing Sets will be awarded to the next best entries. Full allowance will be made for age. No competitor may receive more than one prize.

3. Decision of judges is final and legally binding. No correspondence will be entered into.

4. Each completed entry must be accompanied by shoe illustration from Guarantee Slip found in Wayfinders box. Entries received without this illustration will be disqualified.



5. No responsibility can be accepted for entries delayed, damaged or lost in the post. Altered entries, or those which are unreadable or late, will be disqualified. Entries become the property of the manufacturer of Wayfinders and cannot be returned.

6. Every winner will be notified by post. A complete list of winners can be obtained by sending a s.a.e. to Wayfinders, 151 Oxford St., London W.1. A complete list of winners and the judges' solution to the problem will be published in this magazine.

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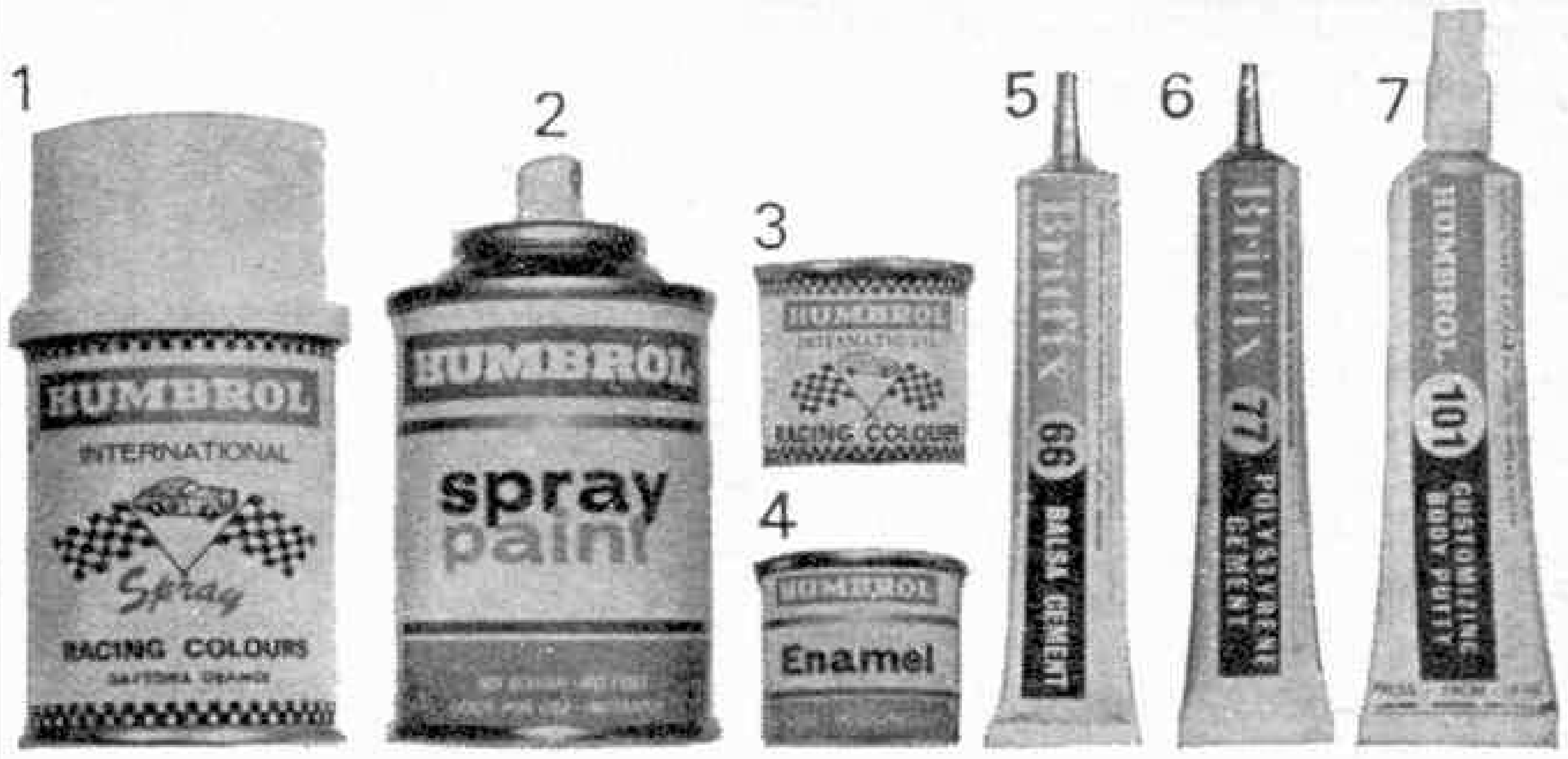

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Scale dimensions the easy way

THE diagram opposite is a nomogram. It may look complicated at first sight but it is really a very simple device which, in this case, gives you scale dimensions for any scale without having to make a single calculation. All you have to do to use the nomogram is draw a straight line with a pencil and ruler from the *full size* dimension to the actual *scale* you are interested in and then read off the corresponding *scale* dimensions where the line cuts the centre scale. It's as easy as that! And if you do not want to mark the nomogram, simply lay a ruler or straightedge in position without actually drawing the line and 'spot' the point to read off on the centre scale.

Now a word about the scales themselves. The left-hand scale, representing the *full size* dimension, is graduated in feet and fractions of a foot (e.g. 1½ in. or 3 in. steps up to 15 ft.). From 15 to 20 ft. the graduations are in 6 in. steps. From 20 to 40 ft. the graduations are in ft.; and above 40 ft. in 2 ft. steps.

The centre scale, which gives the scale dimensions *in inches* is graduated in inch fractions on one side and decimals on the other. This means that you can read off the scale dimension in either, as preferred.

On the right-hand side are shown the various scales divided into three separate groups. On the left are the usual *fractional inch* scales—i.e. 1 in. equals 1 ft., ⅞ in. equals 1 ft., etc., down to 1/32 in. equals 1 ft. Also on this side are the 'millimetre' scales—i.e. 15 mm. equals 1 ft., 14 mm. equals 1 ft., etc., down to 1 mm. equals 1 ft. On the other side, a further range of standard scales is given from 1/10th down to 1/200th.

There are various uses to which the nomogram can be put, both for finding true scale dimensions and comparing different scales and different scale dimensions. Also, given a full size dimension and a corresponding scale dimension you can find the scale involved. The following examples show typical uses.

Example 1: To find the true scale span of a 1/72nd scale model of an aeroplane of 38 ft. 4 in. span.

Connect 38 ft. 4 in. on the full size dimension scale to 1/72 point on the right-hand vertical line and read off the answer on the centre scale. Ans.: 6·4 in. approx. or 6⅜ in. approx.

This is a simple way of checking the accuracy of the span of scale plastic kits!

Example 2: A particular model is made to 2 mm. scale. What other scales are very nearly the same and could be used for matching models?

This time, find the answer directly from the right-hand vertical line. Thus, 1/150th scale is very nearly the same as 2 mm. scale; 1/144th scale is also quite close.

Example 3: To find the scale dimension in 5 mm. scale for a full size dimension of 84 ft. 1½ in.

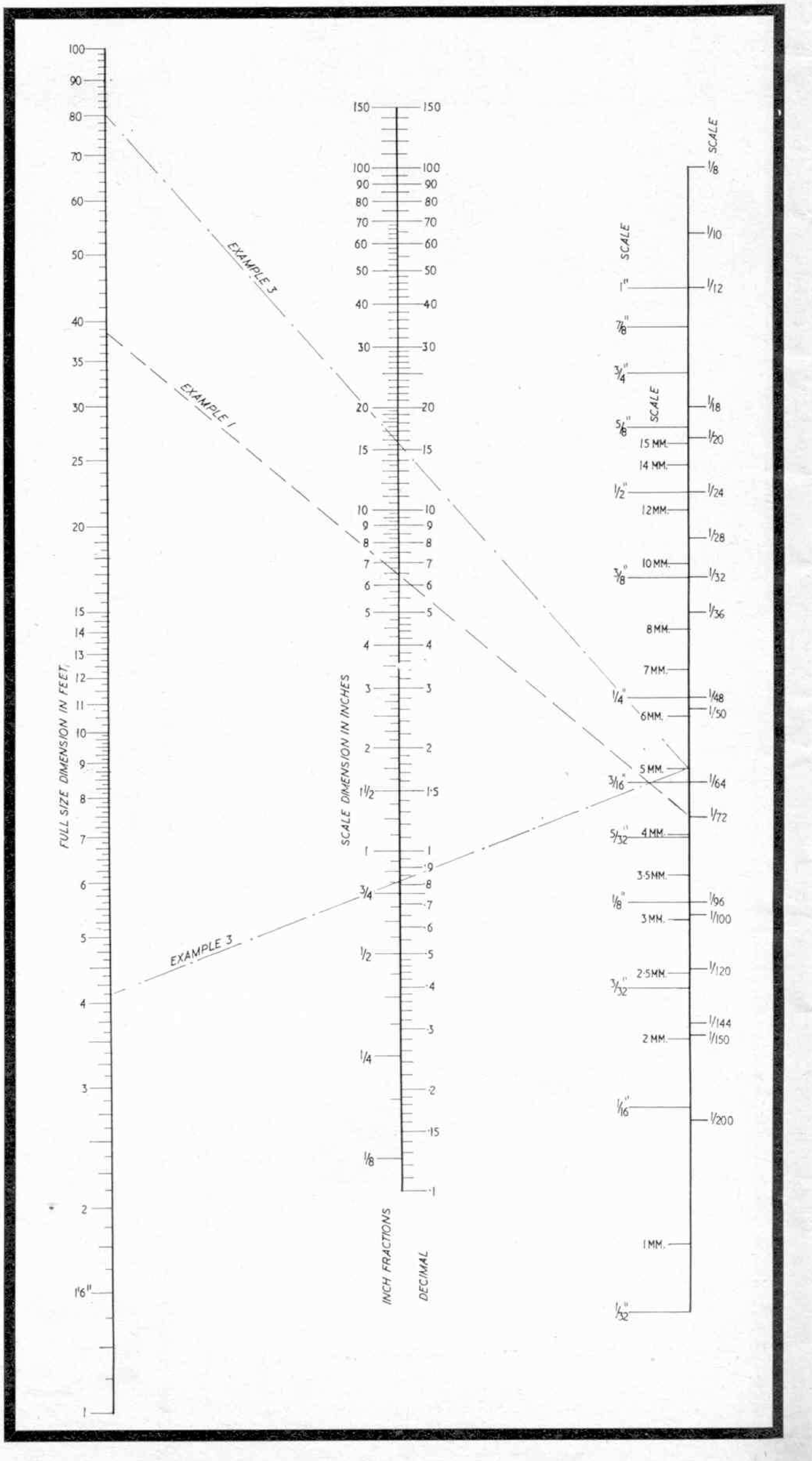
This could be found in one from the nomogram scales, but for a more accurate answer tackle the problem in two parts.

First, find the scale dimension for, say, 80 ft. Ans.: 15¾ in.

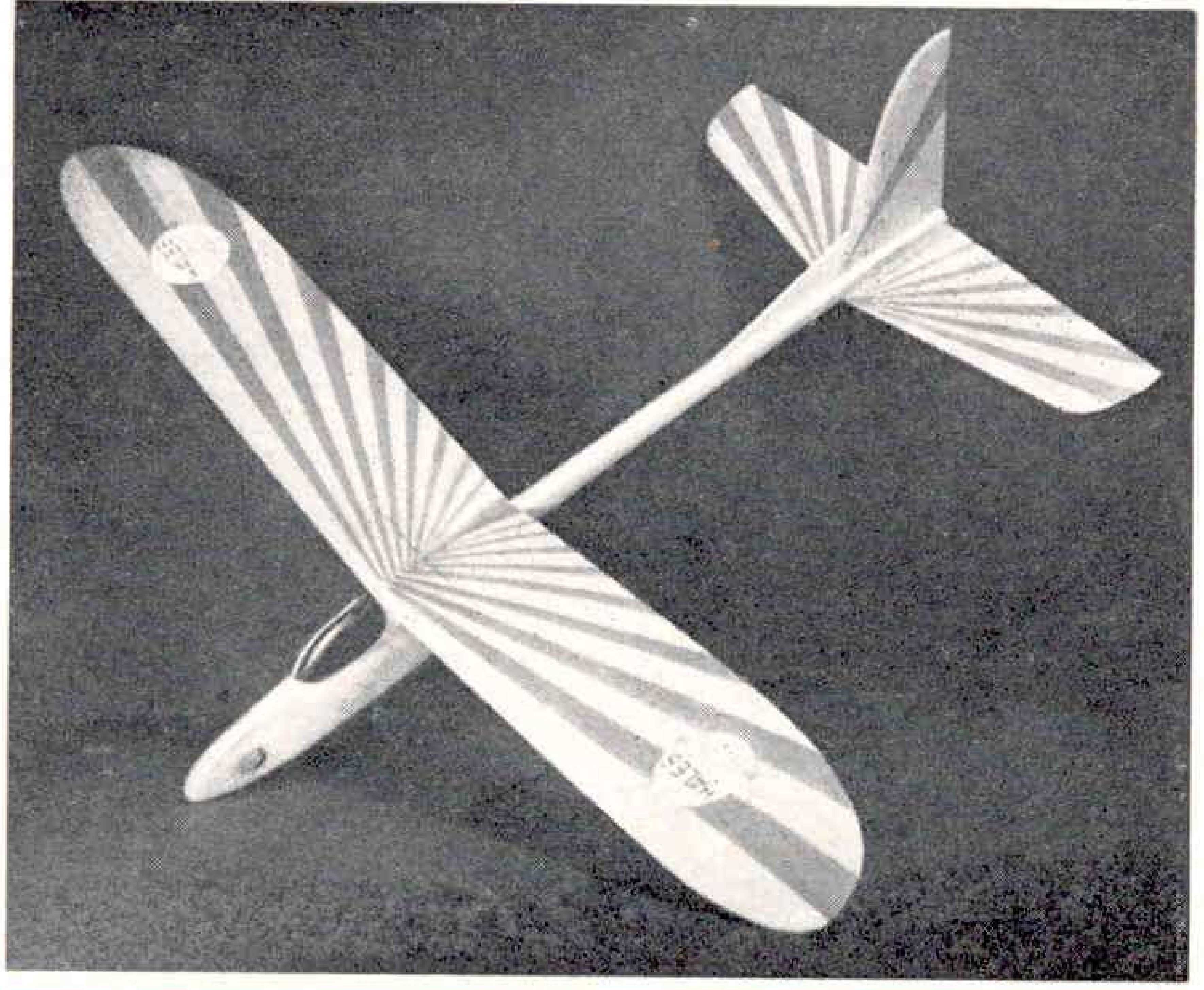
This leaves another 4 ft. 1½ in. dimension to be 'scaled', which is done on the lower part of the nomogram where the scale graduations are more widely spaced.

Scale dimension for 4 ft. 1½ in. = 13/16 in.
Now add the two together—
Scale dimensions for 80 ft. + 4 ft. 1½ in.
= 15¾ in. + 13/16 in.
= 16 9/16 in.

These are just a few examples of working. There are many others. In fact, this nomogram should save you all calculations normally necessary to arrive at scale dimensions.



The fastest way to build a real glider



The Flying Clippers

If you've ever thought you'd like to own a flying model aircraft but shied away from actually building one because of the skill demanded by many balsa kits, then you should think again. Go along to your hobby shop, and ask to see the latest pair of Hales Frogflite glider kits. There's the big "Super Clipper" at 16s 6d which measures over three feet from wing tip to wing tip and the smaller "Clipper 26", of two foot two inches span. Both are of all-balsa prefabricated construction and the completed models are not only first class flyers but also extremely rugged.

We built our Clipper 26 and decorated it one rainy Saturday and it was ready to take the air the following day. Here are some photos of the model being assembled; even non-Clipper builders will pick up some tips from our pictures! The Super Clipper, by the way, is of very similar design and construction.

1 The fuselage is of pod-and-boom type, the nose pod being formed by sandwiching two pre-cut pieces of $\frac{3}{16}$ in balsa together. Contact adhesive such as Evo Stik or Bostik is best for joining two large flat surfaces like this, ordinary balsa cement is, of course, quite satisfactory, but it does take several hours to dry right into the centre of the sheet, and meantime, both halves of the pod must be kept pinned together or held with rubber bands. A contact adhesive, on the other hand, will bond the wood in a couple of minutes. Balsa cement is, however, much better than contact glue for joints of smaller area and should be used for all the rest of the model.

2 Round-off the edges of the pod with the sandpaper (supplied in the kit) wrapped round one of the spare pieces of $\frac{3}{16}$ in. balsa from the sheets from which the pod was cut, after fitting the boom, but before mounting the wing. *Don't* round off the corners of the boom where the wing is to be mounted.

3 The wings are made of solid balsa, and are not only ready-cut to outline, but also ready-carved to the correct aerofoil section! They are joined with a plywood spar, and before cementing them together you should check to ensure that both halves 'mate' properly. It may be necessary to adjust the angle of the inner surfaces slightly with the sandpaper block as shown. For a really strong joint (since you are joining the end grain of the wood) you should first coat the two surfaces with cement, and allow it to dry completely, then coat it *again* and press the two halves firmly together, smearing the cement that oozes out of the joint, along both outer surfaces to form a reinforcing skin. Hold the wing halves with pins until the cement dries.

4 The wing tips are already partly tapered and only need careful sanding to produce a really neat tip. The top one in this photo shows how it should look when finished.

5 Mark the exact centre of the tailplane and glue it under the rear of the tail boom. Check that it is exactly 'square' by using a set square and pin together until dry.

6 After giving two or three coats of clear dope (never use coloured dope—it's much too heavy) you can decorate the Clipper with strips of coloured tissue (Modelspan tissue is sold at all hobby shops). Just cut the tissue to shape, lay it on the wing and paint over it with a brush loaded with cellulose thinners. The thinners will immediately soak through the tissue and stick it to the dope underneath! It's a very quick and effective way to make a most attractive model and it adds almost no weight at all!

Finish off by adding a bit of plasticine (in the kit) to the hole in the nose of the pod to balance the model, push the sharpened wire tow hook into the underside of the pod, just behind the front of the wing, add the wing transfers and your Clipper is ready to go! Easy wasn't it?

The complete kit costs only 12/6.

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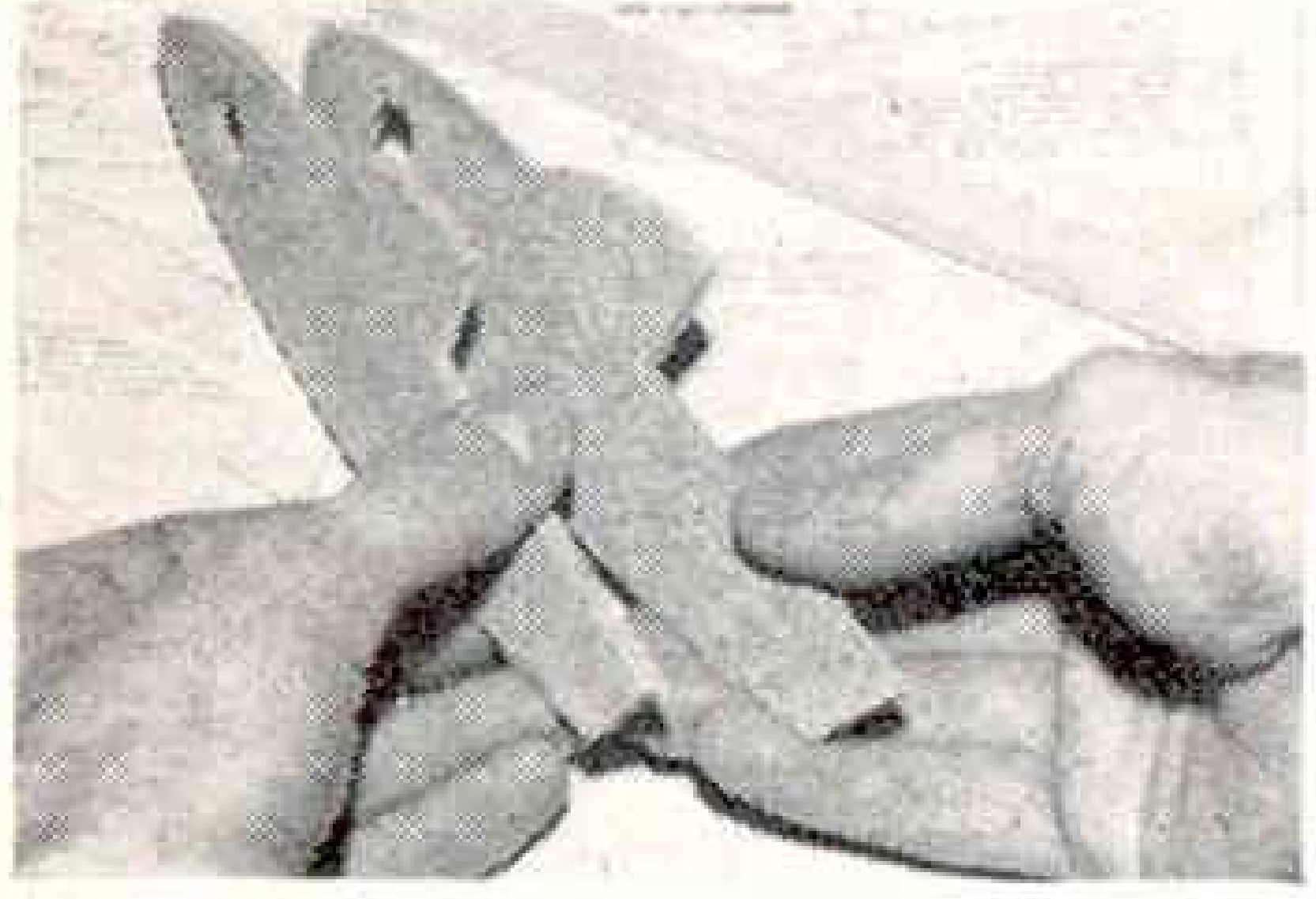

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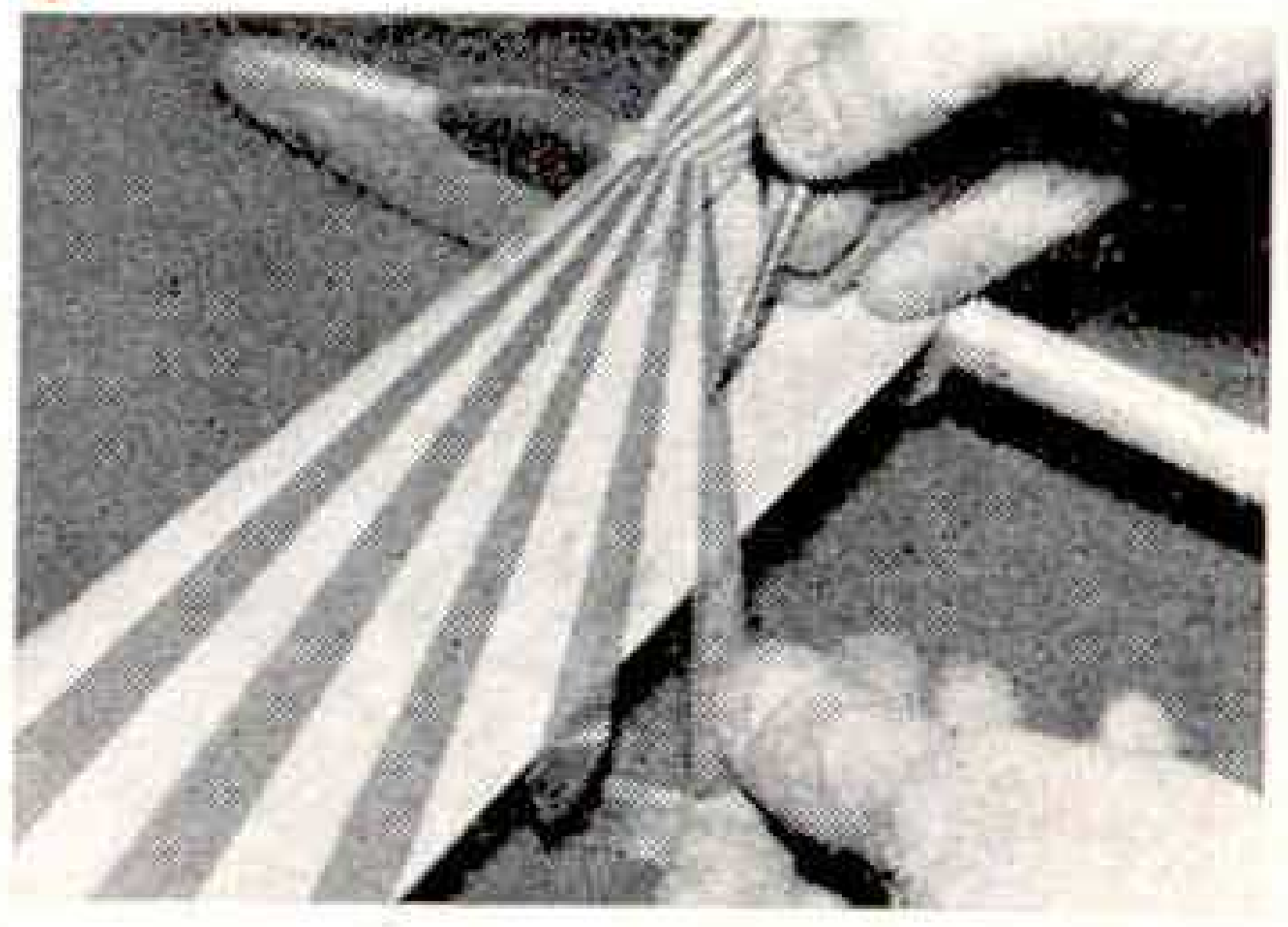

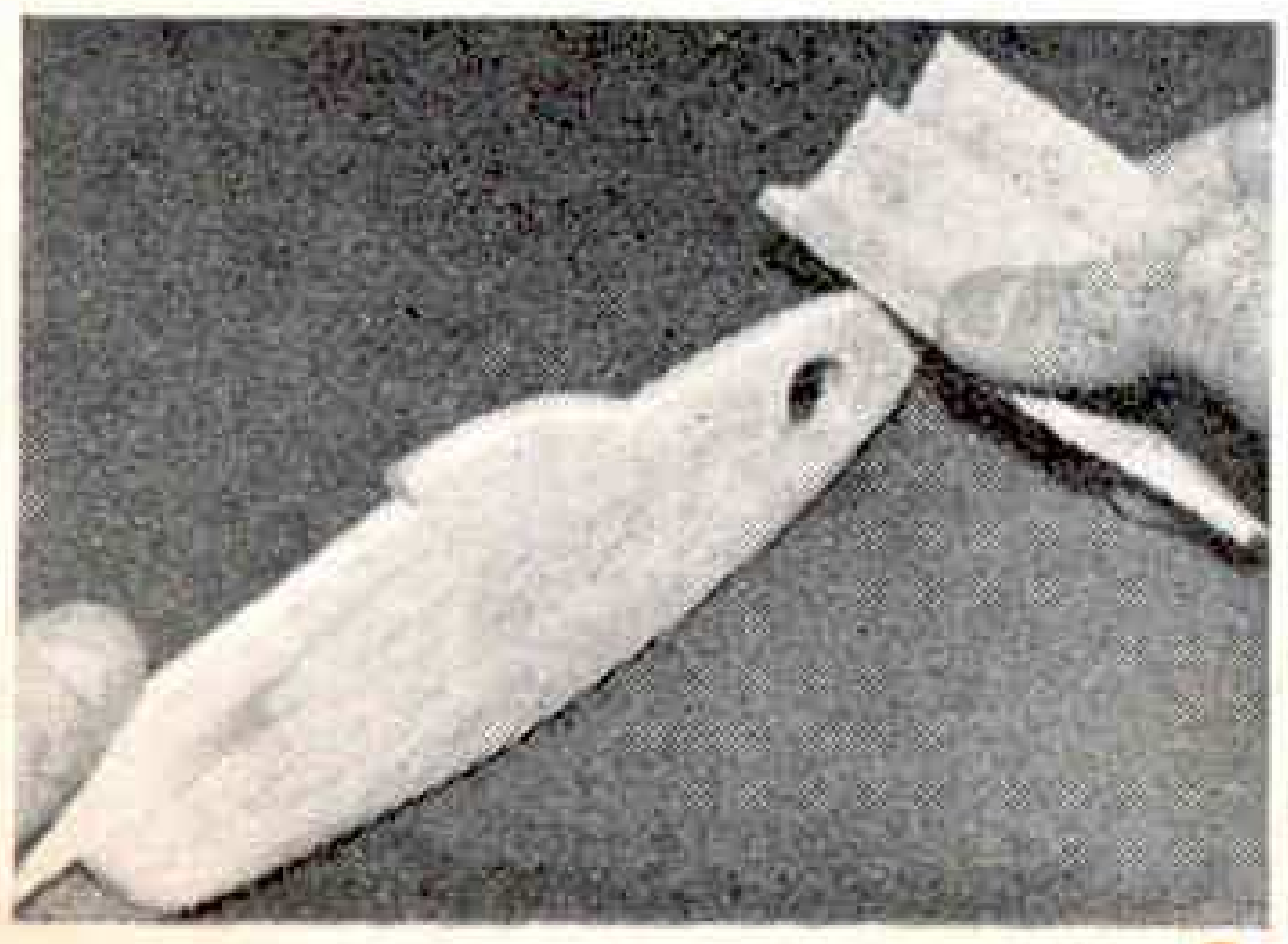

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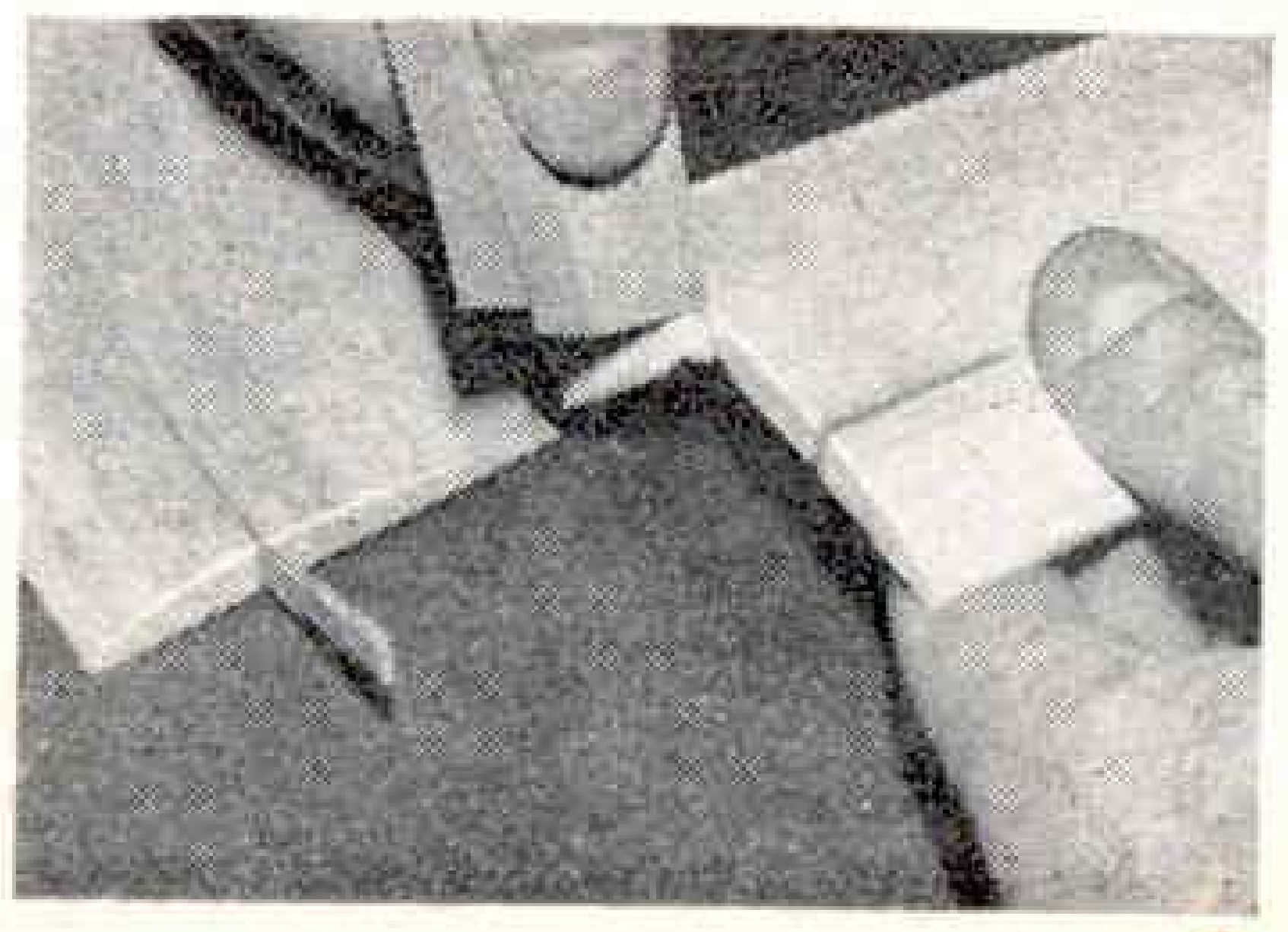

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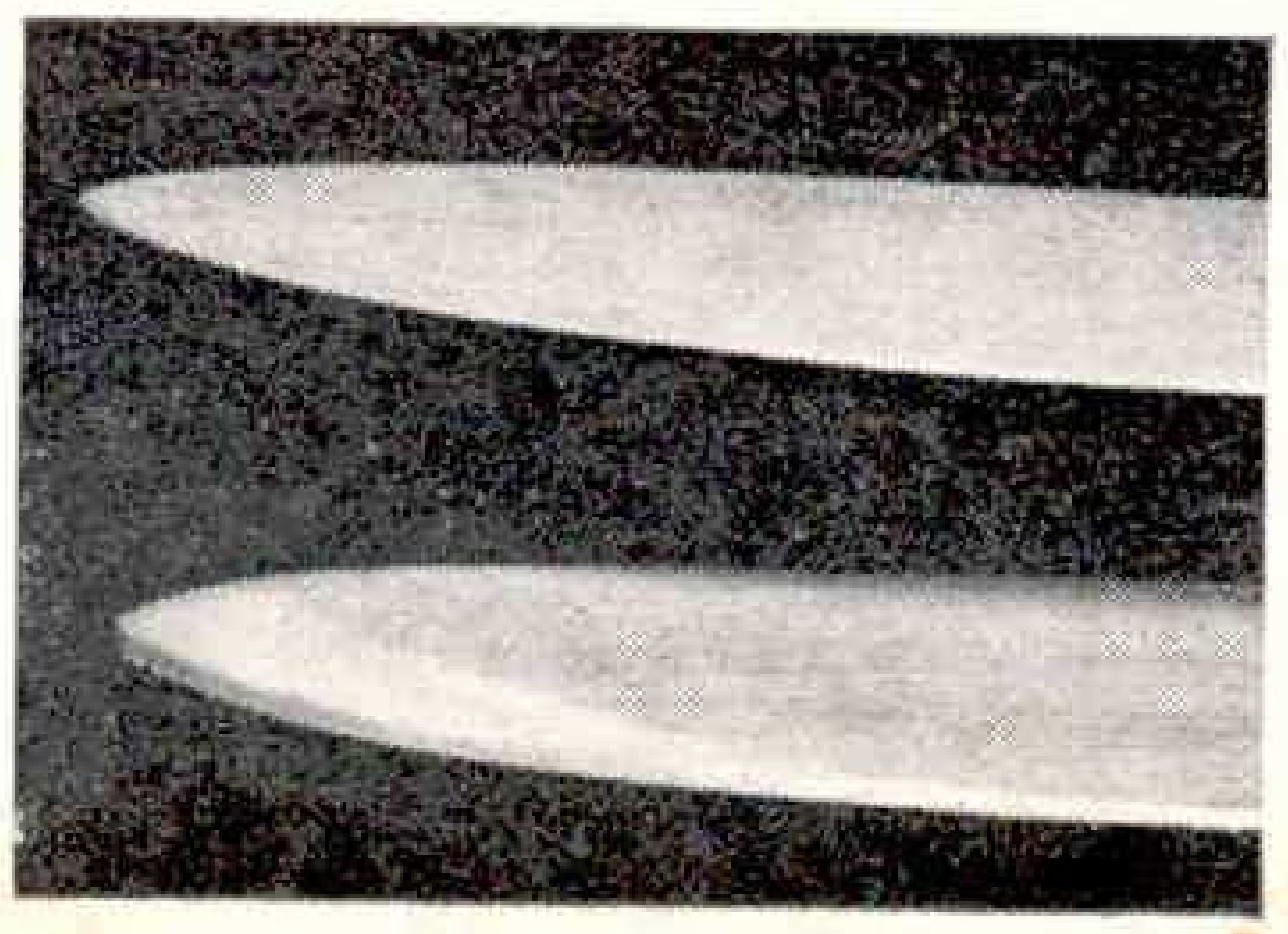

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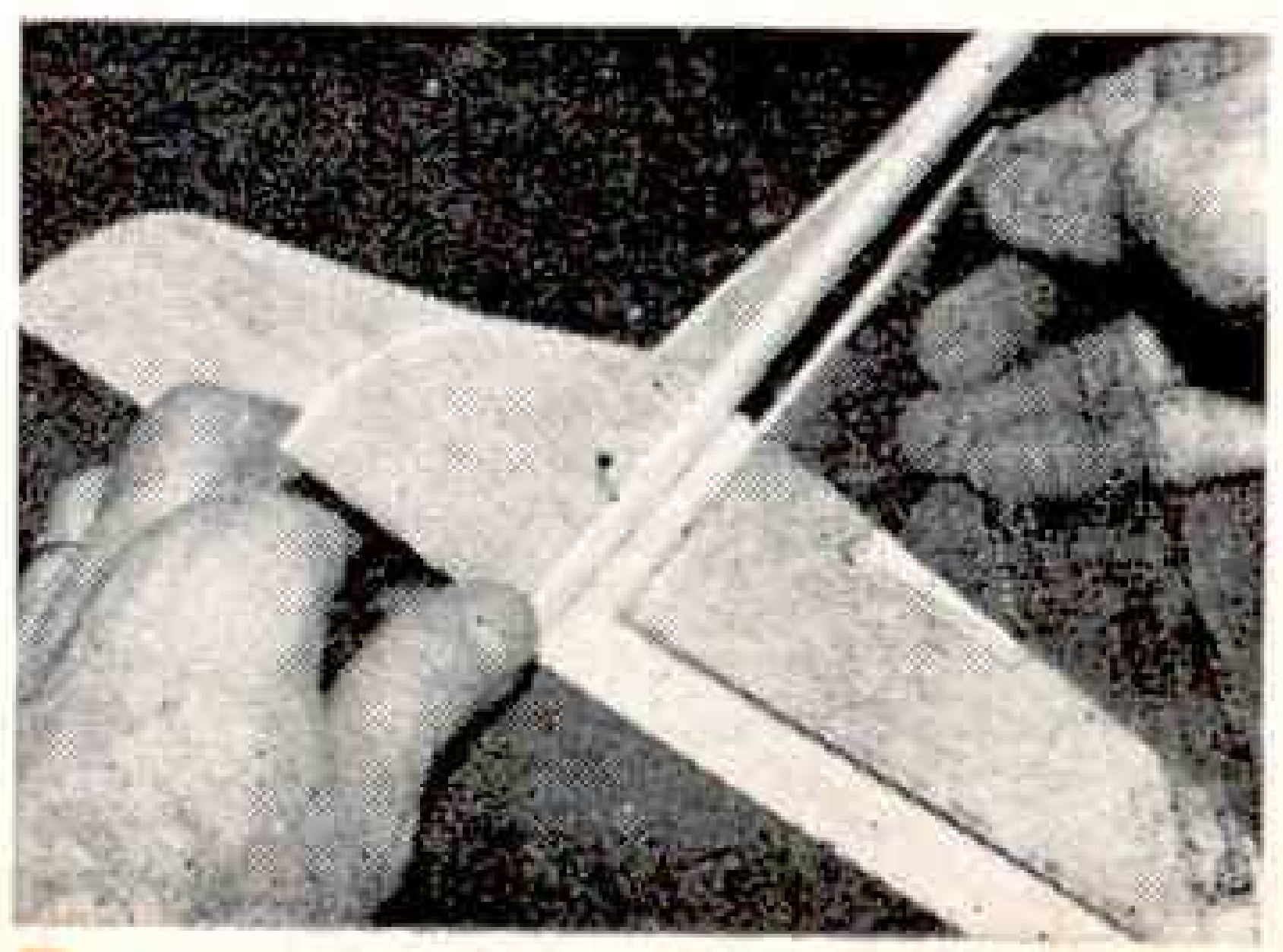


5

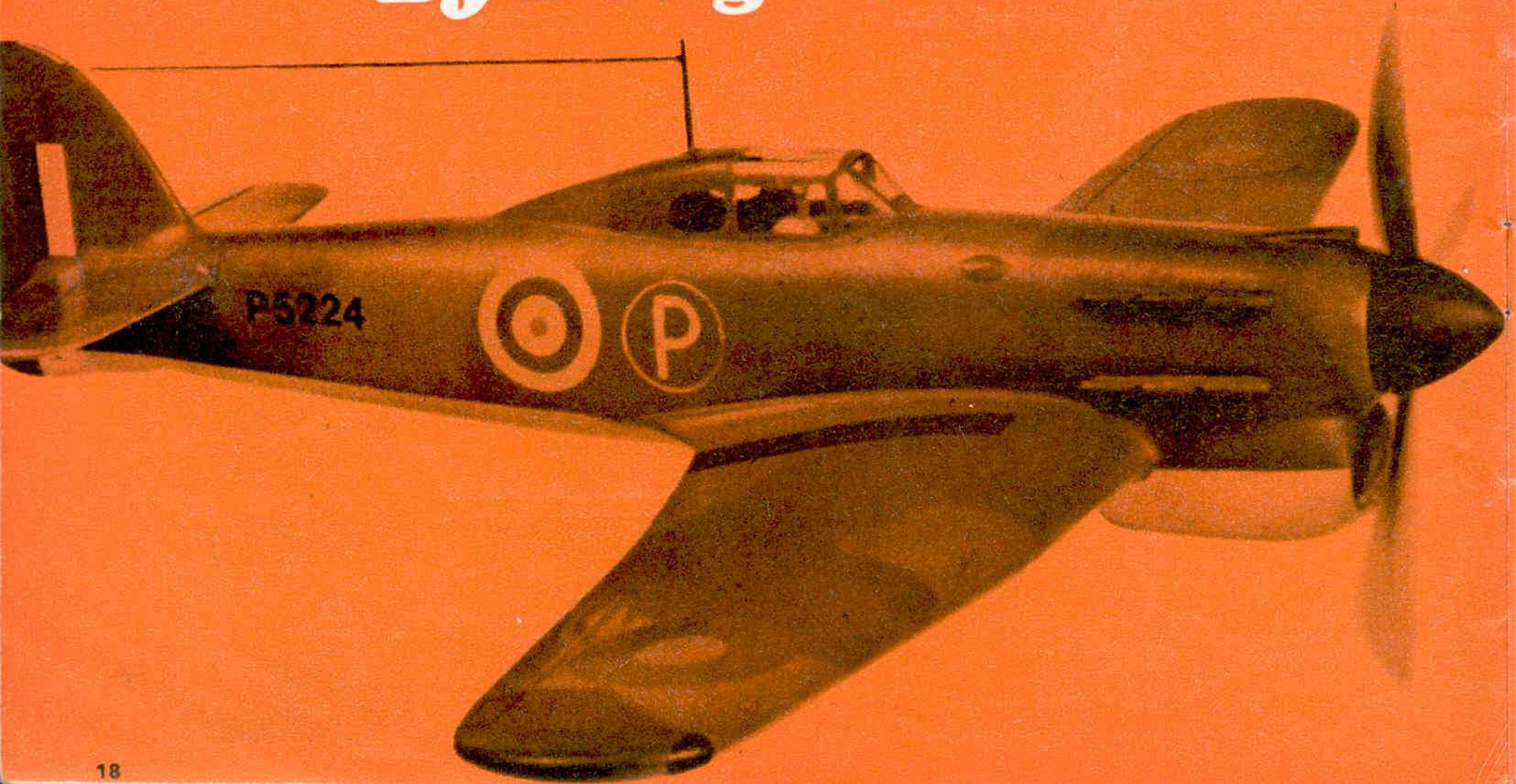
A Hawker Miscellany

The introduction of the Tempest and Hurricane brings the number of Hawker aircraft in the Frog range to six. They are, the Hurricane, Typhoon, Tempest V, Sea Fury, Sea Hawk, Hunter. The Hurricane kit enables you to build it as a Sea Hurricane too if you prefer. In addition to these 'standard' kits, we showed you in the February M.M. how to convert the Tempest V into a Mk. I; last month we embellished the Sea Hurricane and this month it's the turn of the Typhoon, which Doug McHard converts to represent the Tornado.

A whole plastic kit collection could be based on the innumerable interesting products and projects of this prolific manufacturer of fighters—the basic Frog range now gives you enough raw material to keep you busy chopping for just about as long as you like! Hawker aircraft are well documented and data is not hard to come by. We would particularly mention the excellent Profile series of aircraft booklets in which colour schemes are also given. The Macdonald pocket books of W.W.2 Fighters give you drawings and photographs of a whole range of possible conversions as well; and on page 28 John Taylor tells you about some Hawkers that didn't quite make it!

Opposite page, top left: two Tempests—in the foreground the 'standard kit' version and behind it our Meccano Magazine February conversion to a Mk. I. Top right: both the Hurricanes are built from the standard kit. On the ground a night fighter Mk. IIc and in the air a Sea Hurricane. Bottom left: the Typhoon and the Hunter. Bottom right: the Sea Fury and the Sea Hawk

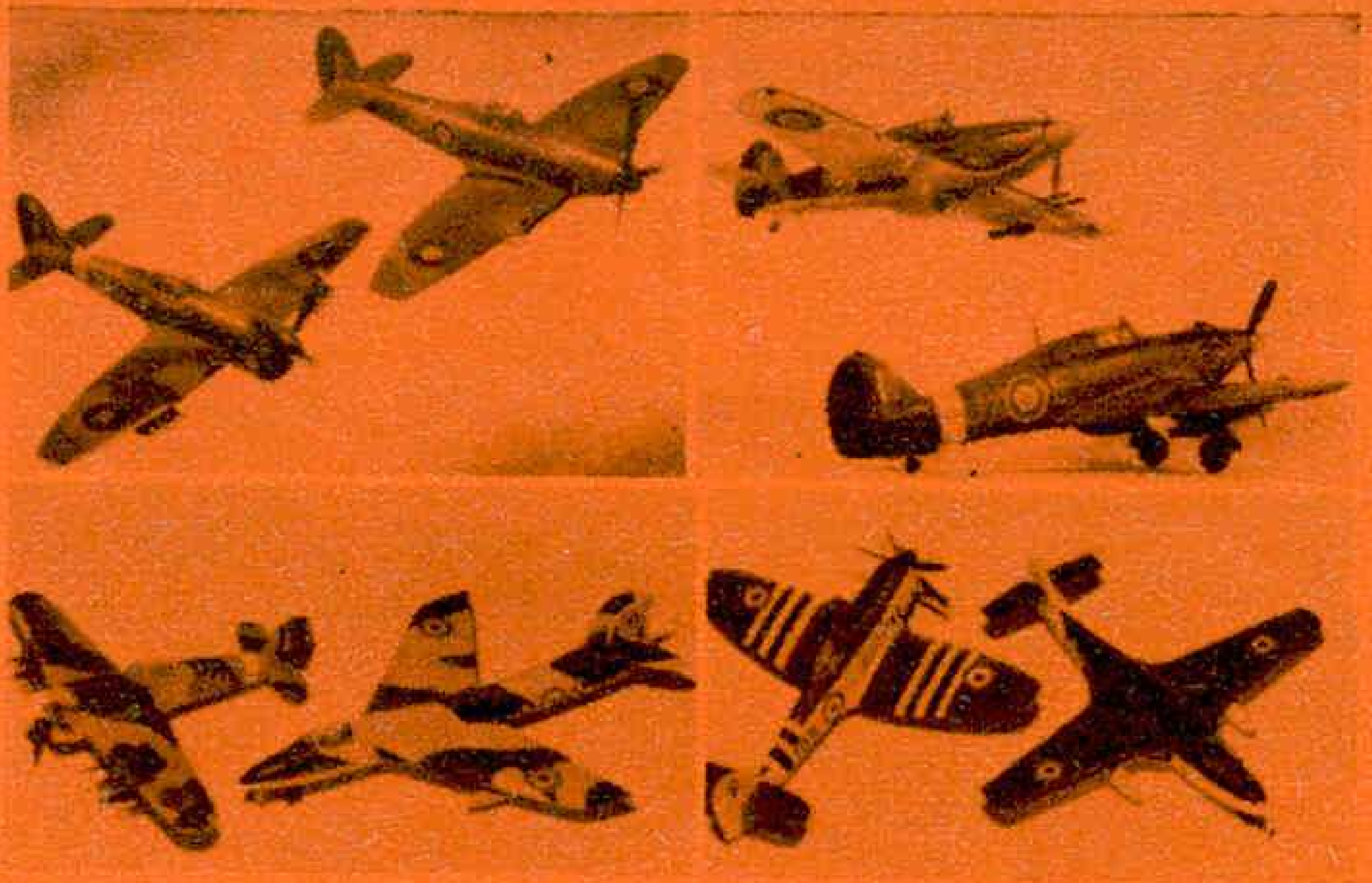
By Doug McHard



1 When the cement joining the fuselage halves has thoroughly dried, saw off the nose just ahead of the wing. Use a razor saw and keep the cut as straight as possible. Now mark off four 'spacing bulkheads' on $\frac{1}{16}$ in. thick styrene sheet (Plastikard or Polycard). You will need more than four if the saw cut was uneven, necessitating the removal of yet more material in order to true up the cut surfaces. Refer to the full size sketch to see how many spacers you will need in order to build up the nose of your Tornado to the correct length

2 Fill in the exhaust slots, and cement the bulkheads in place. Use a liquid solvent (Mek-Pak) rather than a tube cement, as when joining large areas like these, the latter softens the plastic too much and takes too long to dry. Be very careful to line up the nose correctly with the main fuselage. When the whole thing is quite dry, it can be filed smooth, removing the file marks with No. 360 'Wet or Dry' abrasive paper (used dry)

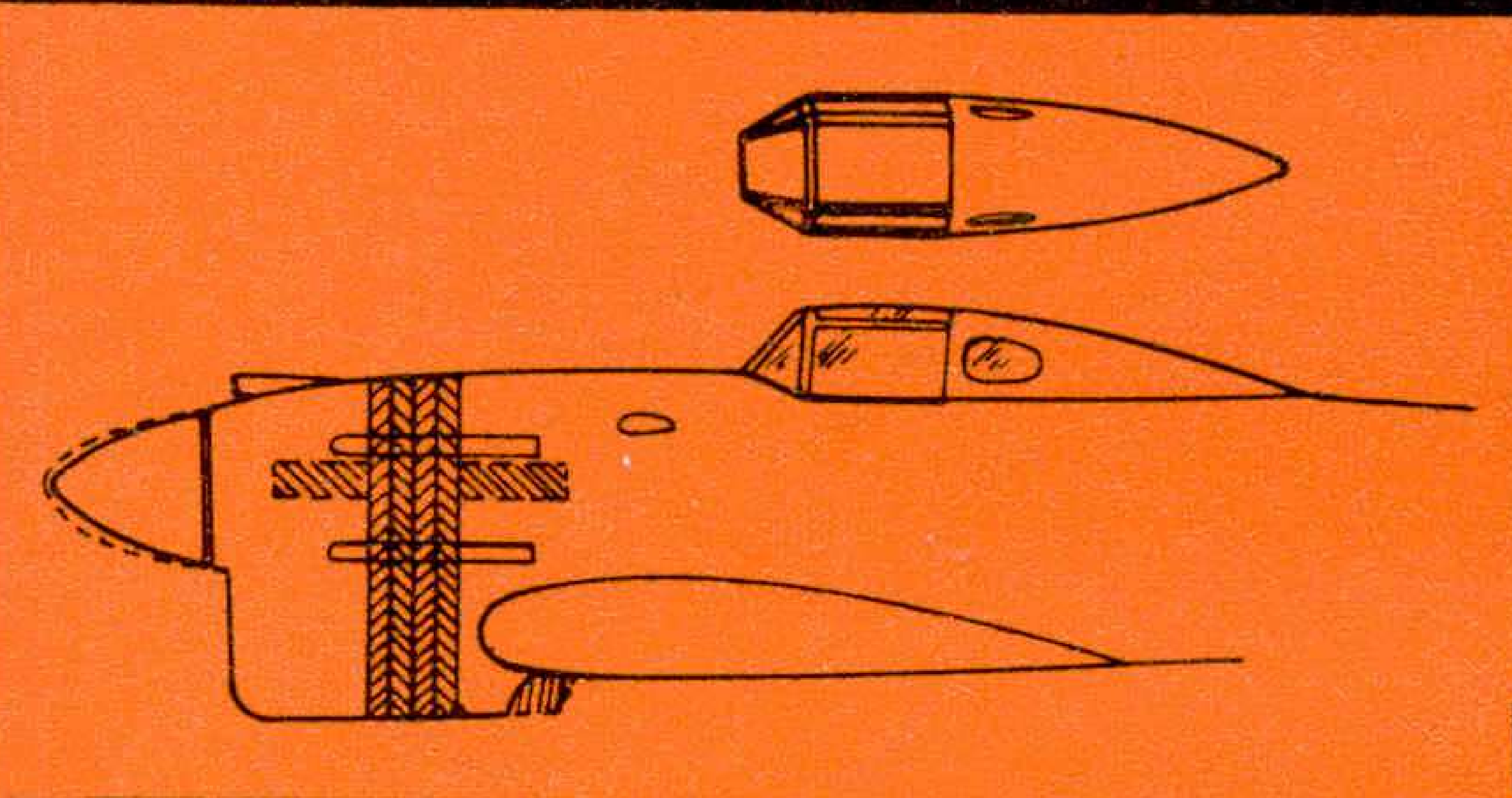
3 Here's the smoothed-up nose. Now saw off the rear of the radiator cowl and fill in the hole left in the fuselage bottom with a piece of sheet plastic

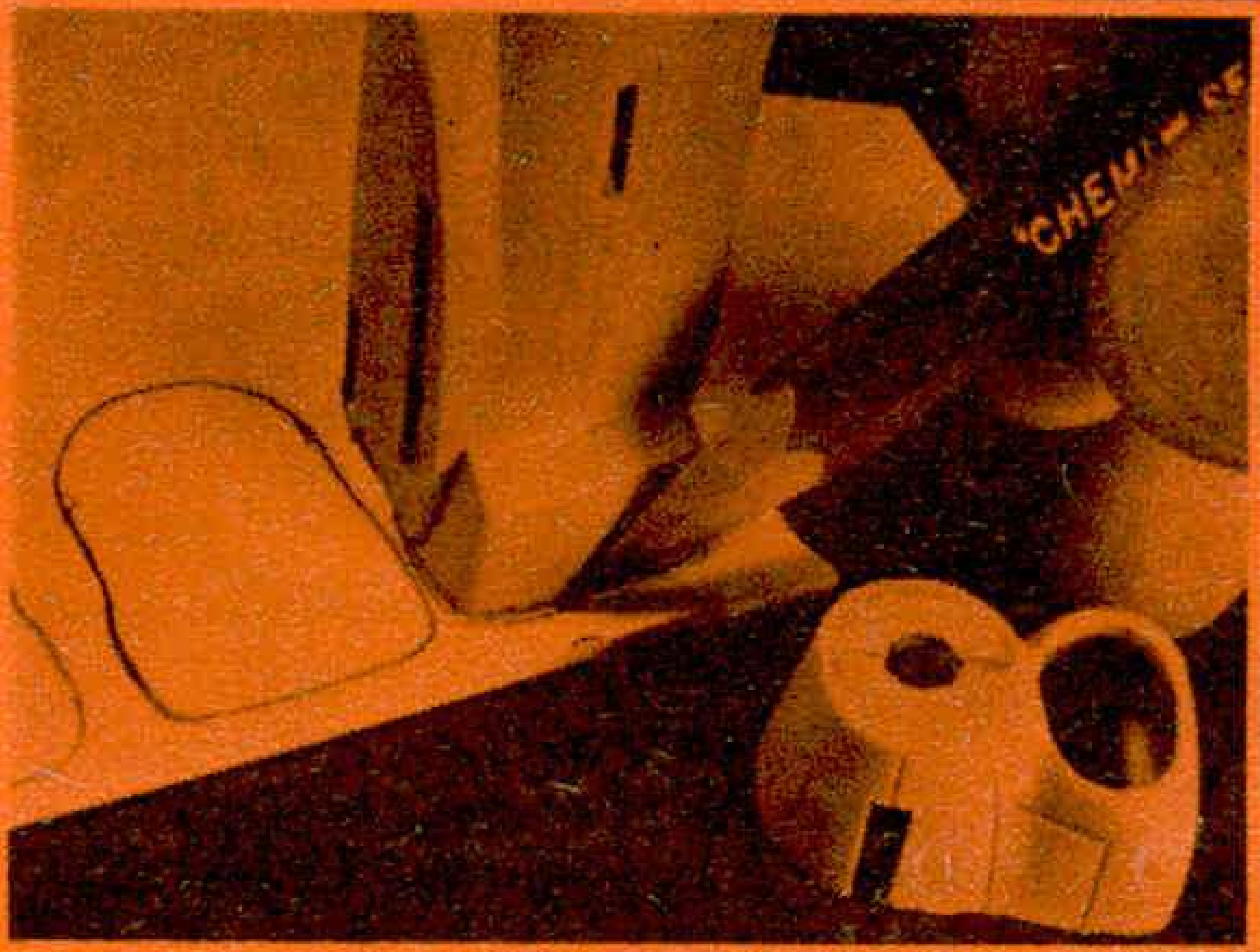


4 The position of the transfers is embossed on the Typhoon fuselage side. Those markings would, of course, be wrong for the Tornado and so they should be filed away. Fortunately, the fuselage mouldings are very thick and there is no danger of 'going through'

5 The completed nose. Note the more-pointed spinner, small top intake (spare stem). Body Putty is used to fill in the engraved panel lines and also to build up the two cylinder bank blisters' over the top exhausts. The slightly bulbous sides of the Typhoon's nose are also filed until the panel between the twin exhaust stacks is almost flat. Putty is used to fashion the little blisters between exhaust and cockpit. The exhaust stacks are filed up from $\frac{1}{16}$ in. plastic sheet. Our cockpit was moulded from acetate sheet (instructions were given in the March 1966 issue) but if you wish, you can use the Typhoon blister hood and build up the rear fairing from Plastikard or Body Putty

Comparing the simulated in-flight photograph of our finished Tornado with photographs of the real one, it is apparent that our cockpit canopy is just a trifle too high and the nose could do with being $\frac{1}{16}$ in. longer. Colour scheme was dark earth and dark green upper surfaces and trainer yellow undersurfaces with a yellow 'Prototype P' in a yellow circle on the fuselage sides. Propeller and spinner matt black with yellow tips





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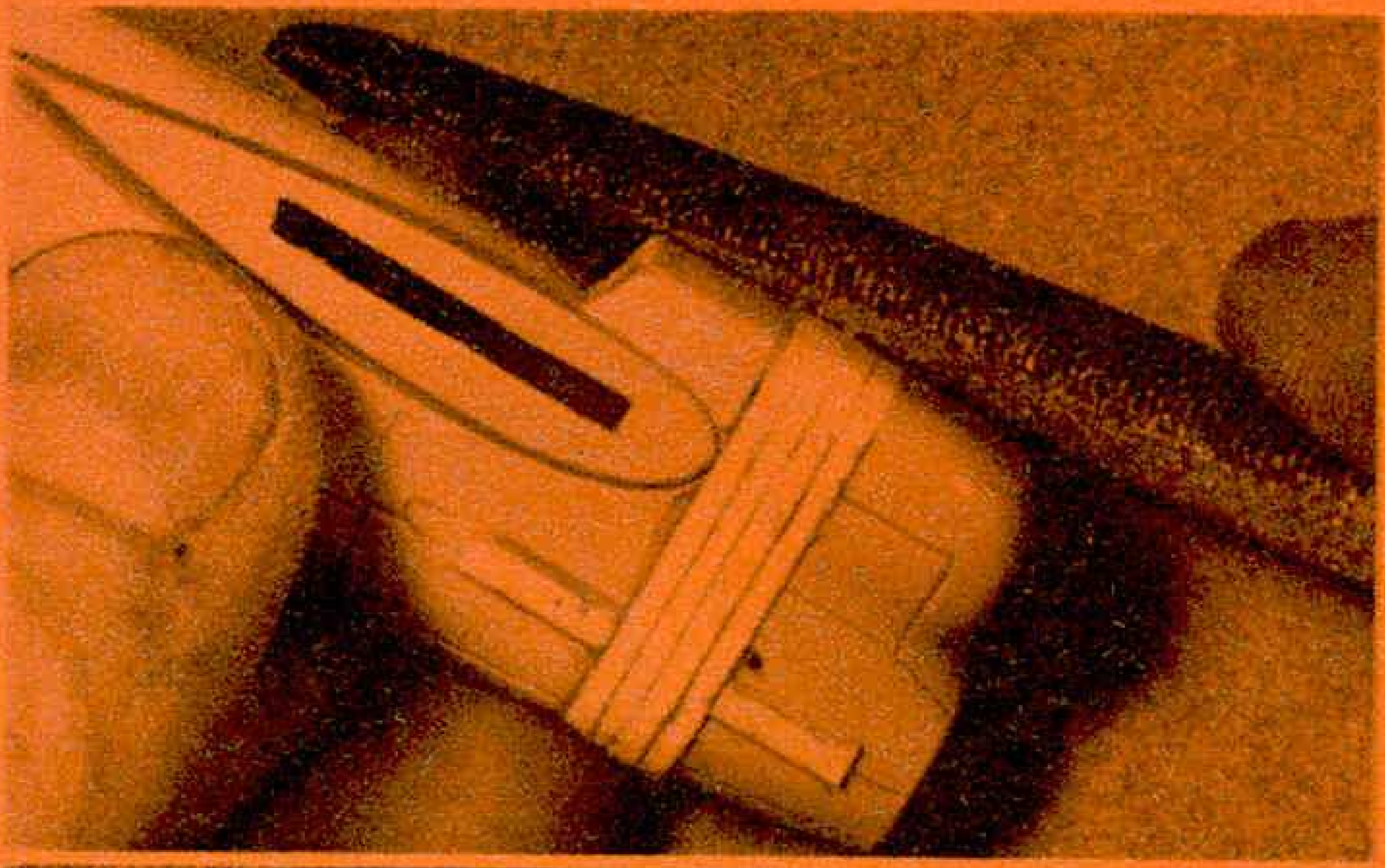

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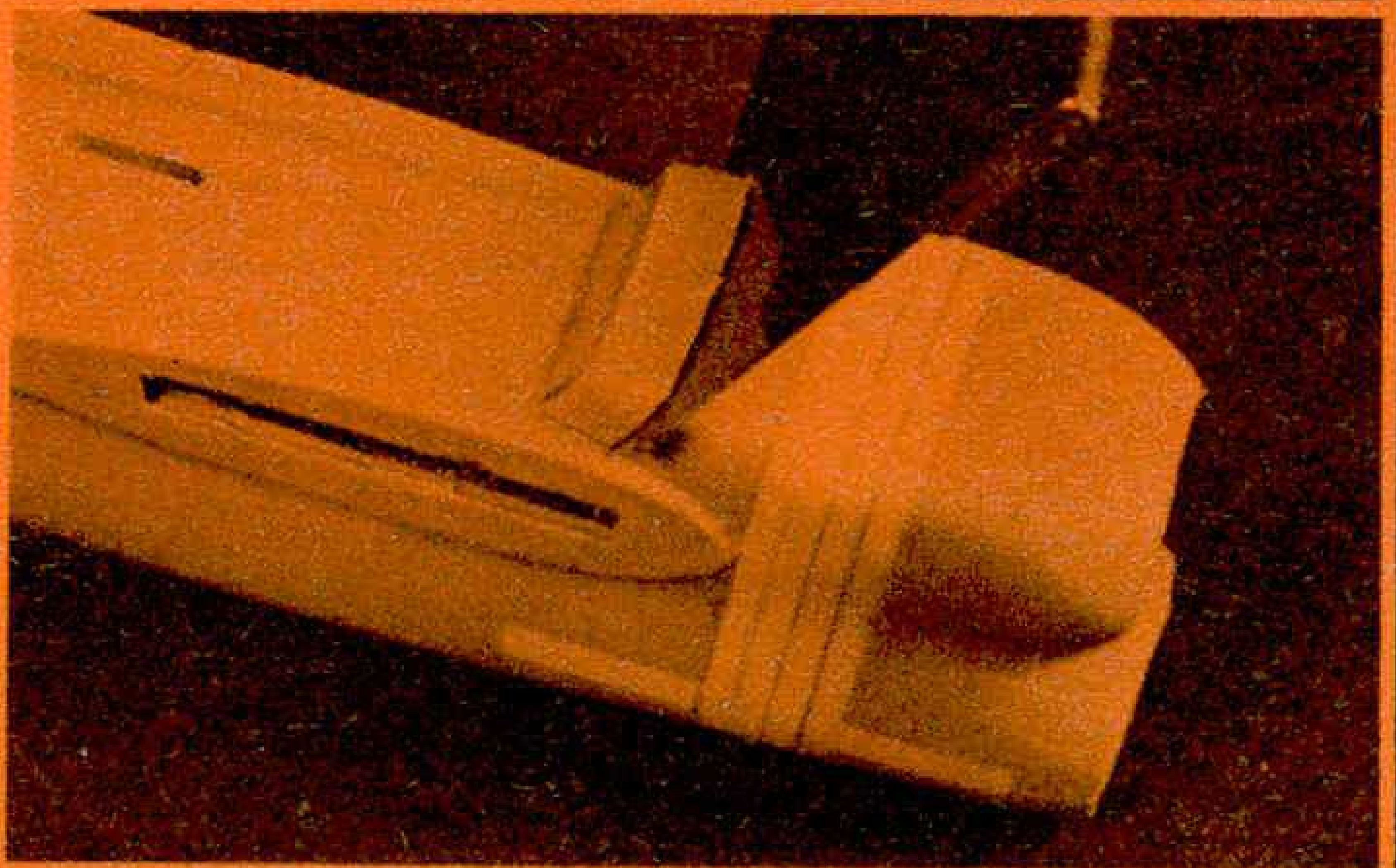

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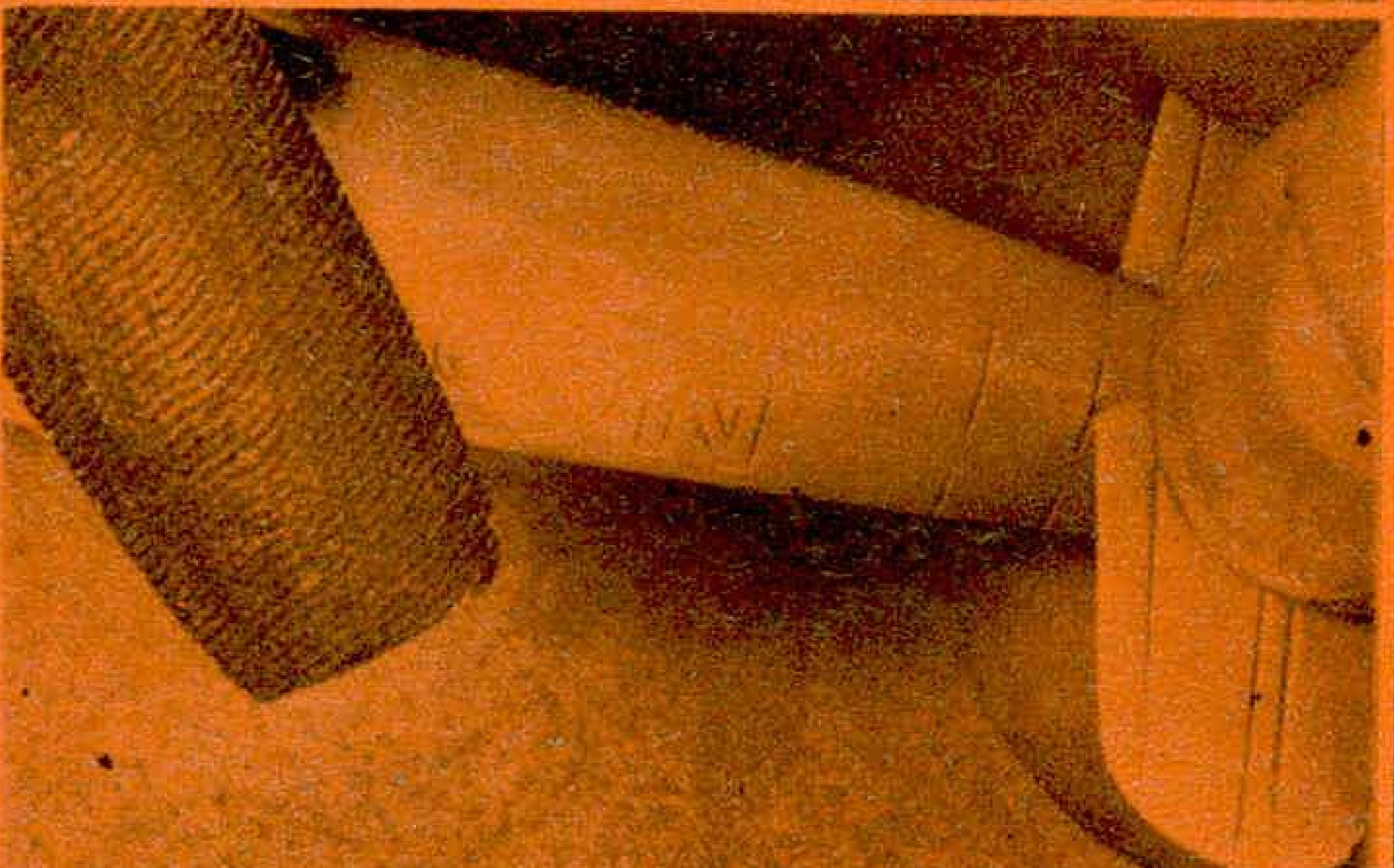

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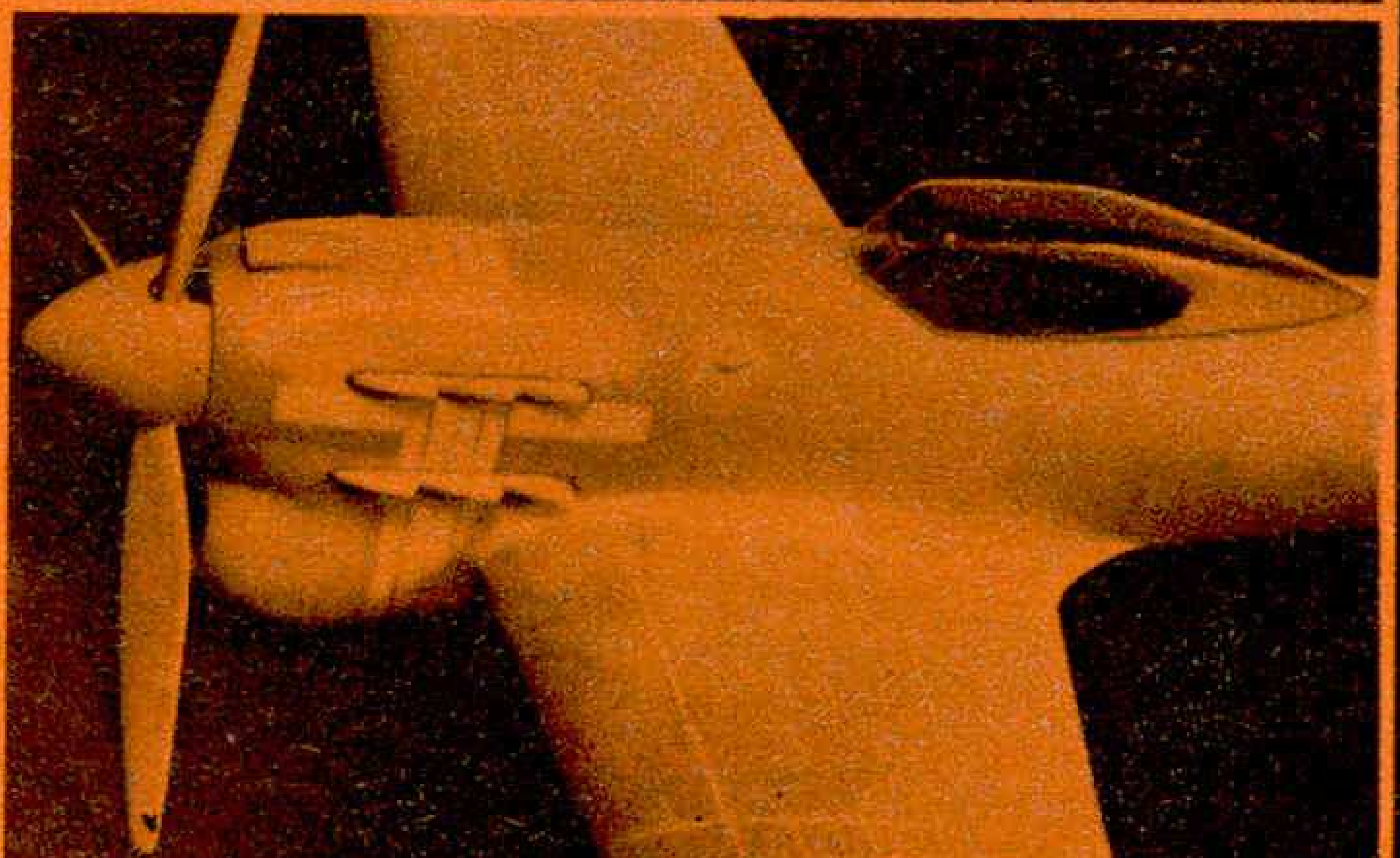


5

Contest '67

Big Cash Prizes for your Meccano Models

From this moment on, all you Meccano Model-Builders can stop THINKING of having a go at a new model, but can get down to some serious BUILDING. If you don't, you may be too late to enter in this year's Meccano Model Contest—NOW OPEN! True to more than 50 years of Meccano Magazine tradition, we are delighted to announce the start of yet another competition in which valuable cash prizes are offered to the builders of models which the judges, taking all things into consideration, feel to be most worthy of success.

Open to all

As is customary, the competition is open to every owner of a Meccano Set living anywhere in the world and no limit, minimum or maximum, is set on either the number of entries which may be submitted or the quantity of parts which must be used. Any kind of model is eligible for entry, unless taken direct from a Meccano Book of Instructions, and all will be judged on their individual merits. *The only stipulations are that the model or models must be built entirely of standard Meccano Parts and must be your own unaided work.*

Prizes will be awarded for what, in the opinion of the judges, are the best-built models with particular attention being given to those in which the more unusual parts are put to good use, as well as, of course, to originality of subject. Remember, too, that a small well-built model stands just as much chance of success as a large, unstable example, so don't be put off entering the contest just because you don't own a big stock of Meccano. The competition closes on June 30, 1967, for competitors in the U.K. and Ireland and two weeks later, on July 14, for overseas competitors.

Entries will be divided into two sections, A and B. Section A is for competitors under 14 years of age on the closing date and Section B for competitors aged 14 or over on that date. Prizes in these sections are as follows: Section A, 1st £5 5s. 0d.; 2nd £3 3s. 0d.; 3rd £2 2s. 0d.; 10 prizes of 10s. 6d. Section B, 1st £7 7s. 0d.; 2nd £5 5s. 0d.; 3rd £3 3s. 0d.; 10 prizes of £1 1s. 0d.

How to enter

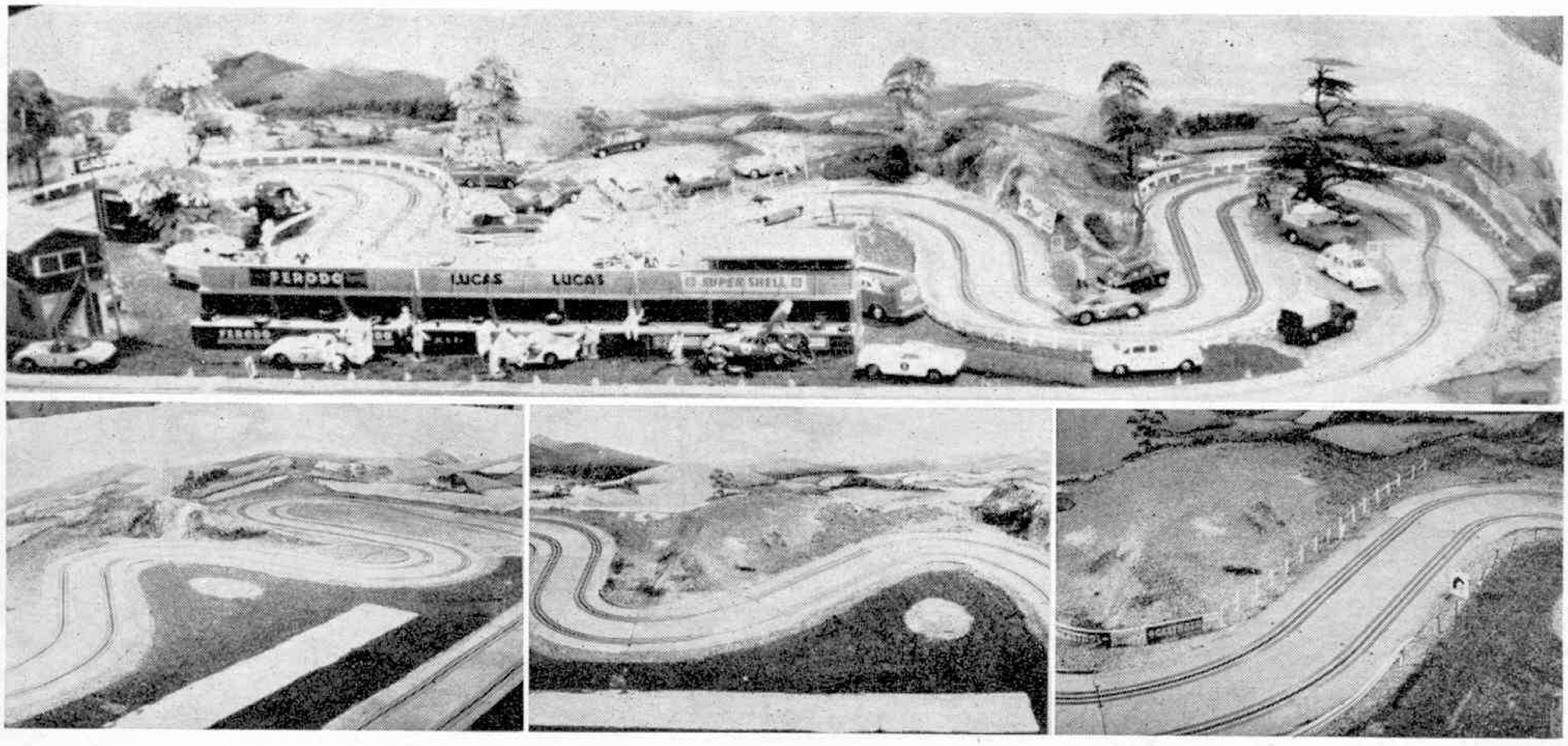
Once you have built the model, obtain a good clear photograph of it, or, failing this, a reasonably detailed sketch. If you are not an artist yourself, it is quite permissible to have a friend prepare the sketch. It is also advisable to include a short description of the main features of the model with your entry, mentioning any points of interest that you would like brought to the attention of the judges, particularly any interesting mechanisms. Under no circumstances, however, must the actual model be sent.

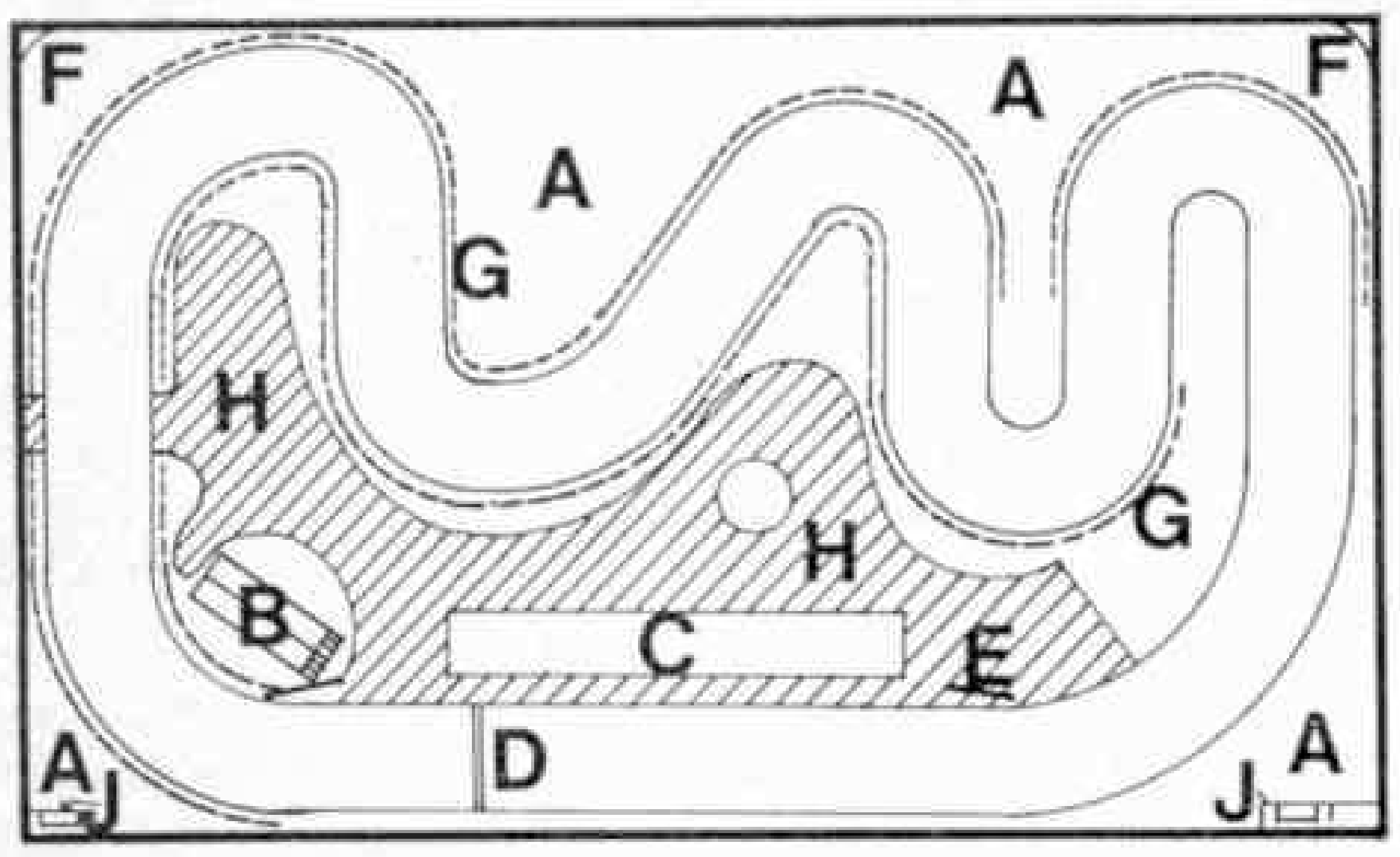
In entering the Contest, write your name and address on the back of each photograph or drawing, together with the Letter A or B, depending on the section for which you qualify, and forward to: Contest '67, Meccano Magazine, Binns Road, Liverpool 13.

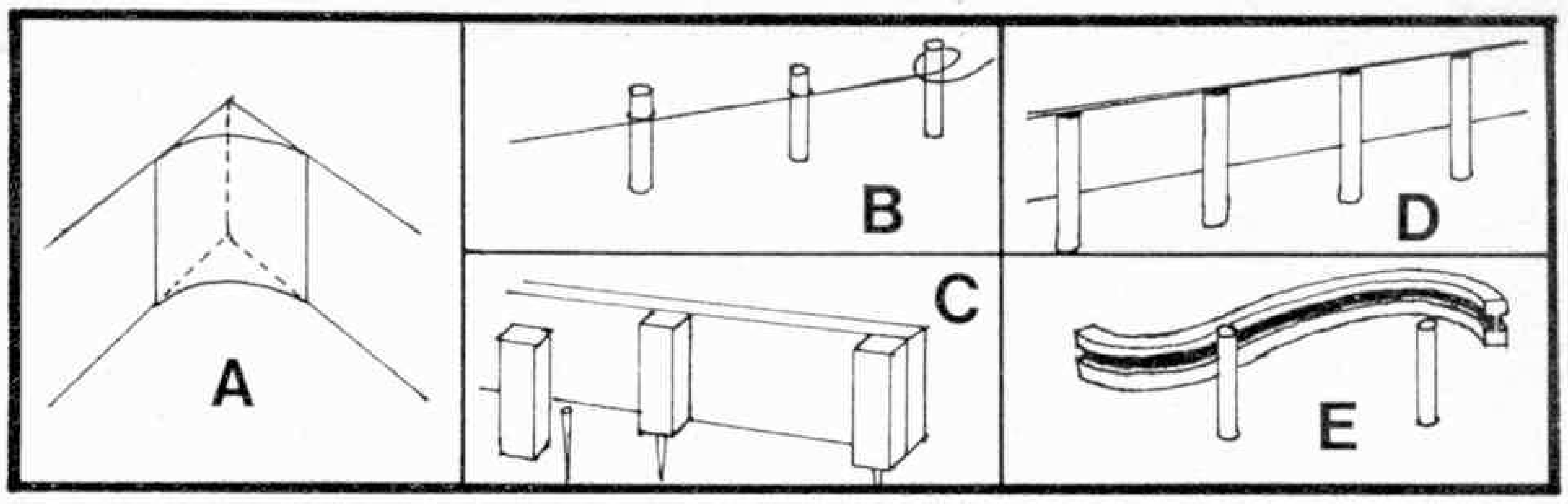
Prize-winning entries become the property of Meccano Limited, but unsuccessful attempts will be returned if accompanied by a suitable stamped addressed envelope or, in the case of overseas entries, a self-addressed envelope and the appropriate International Reply Coupons. It must be understood that entries can be accepted only on the understanding that Meccano Magazine will not be held responsible for any entry damaged or lost and that the judges' decisions are final.

As we pointed out when announcing the last competition, it was surprising how many entrants there were who, in past contests, did not give all the simple details required on the back of their photographs or drawings which, of course, could have meant disqualification. In spite of stressing this in print, however, we still received several incorrect entries, so *please double-check everything* before you finally seal your entry. We look forward to seeing your models!

Building a Permanent Circuit - Part 4







IN last month's article it was said that Peco scenic backgrounds would be used to provide a 'backdrop' for the circuit and this is the next feature to be added. The backboard of the circuit has right angle corners so that it is as well to round these off with a little cardboard so that the sides and back can merge together. The hardboard is dark in colour and to avoid this showing through the background it should be covered with plain white wallpaper, which can be bought for about 3s. 6d. a roll. When doing this, cut the wallpaper into pieces the same size as the background sheets, offer them up to the backboard then cut them out as necessary to clear the contours of the scenery. When this is done they can be used as templates for the background sheets, for it is far cheaper to ruin a piece of wallpaper than a background sheet. Polycell should be used to stick these on and a quarter of a small packet is more than ample for both the white and scenic sheets.

By this time one should have some idea of the proposed detail layout of the circuit; the first thing to decide is where any service roads will be and these are best made by painting them on with matt black paint. Remember that there should be an approach road to the pits and a service road behind them as well as the parking areas provided for the vehicles attendant at every race meeting.

When the roads are dry, laying of the scenery can be carried out, Rovex King Size Colouring being ideal for this. This material, resembling very fine sawdust, comes in several colours and most of these can be used to advantage. No natural scene has the ground all one colour, although greens are predominant, various colours merging into one another. An easy way to achieve realism is to put varying quantities of the different colours, with a preponderance of greens, into a shallow cardboard box, unmixed. Copydex is then brushed on to an area about nine inches square and some of the scenic material is taken from the box and sprinkled quite liberally over the Copydex. A certain amount of mixing will take place as the material is picked up and further handfuls should be taken from different parts of the box, so ensuring gradual changes of colour. When the area to which Copydex has been applied is covered it should be tamped down gently and further patches, of similar area, treated until the whole layout is finished.

Fences are essential, those supplied by S.R.M. being very realistic and not looking at all out of place. If these are set a little way back from the track they will allow a little extra 'slide room', this applying especially if 1/32nd scale cars are to be used. To fix one of these fences, hold it in position then, with a sharp modelling knife, cut out square holes to put the posts into. When all the holes have been cut, apply an impact adhesive, such as Britfix 88, to the bottoms of the posts and push the fence into position.

For a little variation other types of fences can be used and a few ideas are given here. The post and wire type is very easy to make using either matchsticks or $\frac{3}{32}$ in. dowel cut to 1 in. lengths, stuck in holes at $1\frac{1}{2}$ in. intervals. When the adhesive is dry, 5 amp fuse wire is wrapped around from post to post and secured with balsa cement, the finished fence being either left 'natural' or painted white. A similar type of fence, but much stronger, can be made using $\frac{3}{32}$ in. brass rod and soldering on 15 amp fuse wire.

Other barriers can be made by soldering 0 gauge model railway rail on to $\frac{3}{32}$ in. brass rod and painting it white, while walls can be made by cutting $\frac{1}{8}$ in. balsa sheet to a width of 1 in., securing it to the surface by pins with the heads removed, and covering it with brick paper.

All that now remains to be done is the addition of buildings and all those little details that go to provide the realism that makes a scenic track so satisfying. These will be dealt with next month.

The top picture gives a general view of the layout, and shows just how effective scenery can be, even on a small circuit. Notice how the flat backscene blends into the 'solid' scenery. The join between the two can hardly be detected. The three pictures below show scenic work progressing. Left and centre can be seen the service road for the pits, and the backscene in position, and the right hand picture shows the effective use of trackside fencing. Details of how to make the track signs will be given next month.

The left-hand diagram is a scenic plan of the layout. Areas marked 'A' are hills, 'B' is the timekeepers' building, 'C' the pits, 'D' the starting line, 'E' a wall, 'F' the rounded corners of the backscene, 'G' fences, 'H' the roadway (shaded), and 'J' controller sockets.

In the right-hand diagram, 'A' shows the method of using card to 'round off' the corners of the backscene. 'B' shows a simple fence built from matchsticks and fuse-wire. 'C' shows wall construction, of $\frac{1}{8}$ in. balsa sheet, to which strengthening pillars are glued. Pins with heads removed provide the fixings to the baseboard. 'D' is another method of fence construction, using $\frac{3}{32}$nd brass rod as posts, with fuse-wire soldered on. 'E' shows an effective crash barrier made from 'O' gauge rail soldered to brass rod

Let's go bird watching

by B Melville Nicholas

Bird watching is a hobby crammed with thrill and adventure and has the advantage - important when one's pocket money is concerned - that it calls for nothing in the way of expensive equipment

Forty years ago, when I first became a bird-watcher, I had only a notebook with an attached pencil, a torch and my grandfather's walking stick—the whole lot probably worth then no more than half-a-crown. Another advantage of bird-watching is that it is a hobby which can be begun at any age, and at which all have equal chances. Birds are no respecters of persons and although each season has its own peculiar interests and attractions, spring is, undoubtedly, the most exciting period of all.

For surely no aspect of bird life is more fascinating than their annual home-making, but finding their nests is often far from easy, for the birds themselves deliberately choose secluded positions where they hope not to be discovered nor disturbed. Yet, oddly enough, it was when looking for nests that the majority of bird-watchers were first attracted to this fascinating hobby, and when I use the term 'looking for nests' I don't mean robbing nests. Taking birds' eggs, except for very exceptional reasons, is not to be encouraged.

Now, when you start bird-watching, remember the old adage 'Nature yields no secrets to those who hurry' and although a 'step at a time and watch how you walk' is sound advice, it is often just as helpful to sit and watch—provided you have a reasonably wide view of the surroundings.

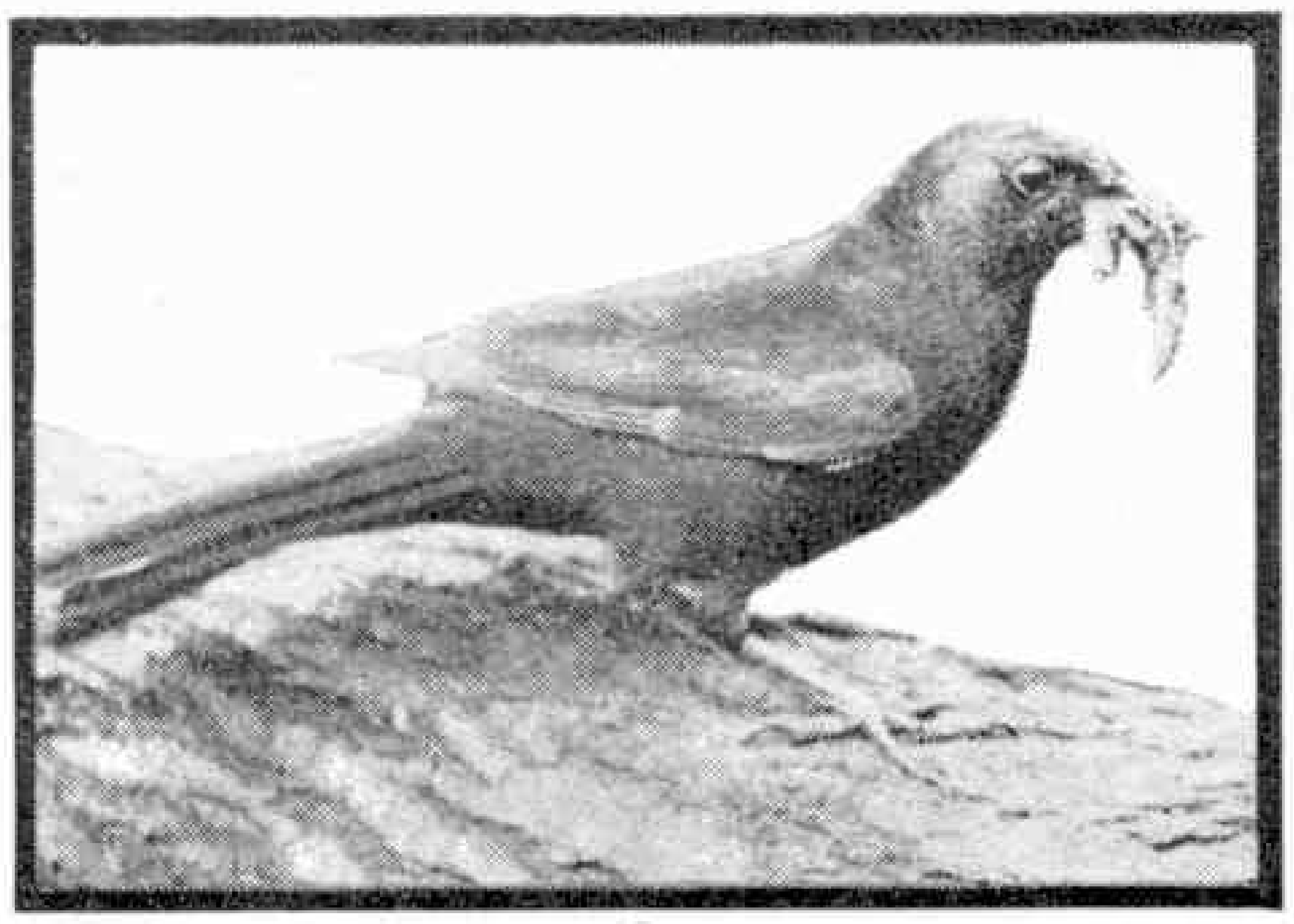
If birds are nesting in the immediate vicinity you will soon see them carrying nesting materials. Watch where they go and if the same birds alight frequently at the same place you are safe to assume that a nest is in course of construction. In your notebook indicate the position of the site, making references to any nearby objects such as a log, a bush or large stone, for these 'landmarks' can be a great help when you eventually look for the nest itself. Follow a similar principle when you see birds with their beaks crammed full of food on their way to feed their brood.

Another important factor, which inexperienced bird-watchers often overlook, is that the clothes you wear matter tremendously, particularly when you are stalking birds, and because you will have to contend with gorse, brambles, thorns and bracken, it's sheer folly ever to wear good clothes. The secret is to have an outer garment which blends with the type of territory through which you are going. If you are after woodland birds, anything of a brownish hue would match your environment reasonably well, while for the more open countryside choose greenish-grey. Khaki shade is a good all-round colour, but avoid whites, blues, reds and yellows. I smile as I recall a friend of mine from one of our large industrial cities who came to go with me to watch and photograph nesting duck, and was wearing a large white Panama hat with a floppy brim about the size of a bicycle wheel!

Nests are, however, often situated in such a dense jungle of growth that to see what is in them is by no means as simple as it sounds, and this is where your walking-stick proves its worth; but some birds place their nests too high up for you to look into them, and this presents yet another problem but it can be overcome if you make some sort of gadget (here's scope for inventive minds) by means of which to attach a mirror to the end of your walking-stick. By holding the mirror over the nest the contents will be reflected quite clearly in the glass. Specially constructed telescopic rods with mirrors attached can be purchased for this purpose, but it's far more satisfying to make one yourself. In any case, never put your hand into a nest you cannot look into to 'feel' what's there—you could get a surprise.

The warning applies with even added emphasis to nests in holes in walls, hedges and hollow trees. Cold shivers race down my spine even now as I recall the old weather-beaten hollow ash in which tawny owls had often raised their families, but on the occasion when I put my hand inside it contained a litter of baby rats. Fortunately neither of the parents was at home.

To investigate any holes, hollows and cavities, use your torch. Owls, woodpeckers and jackdaws, to mention but three species, occupy such situations and on one or two occasions jackdaws have nested in hollow trees where a bulge in the tree-trunk obstructs the torch's beam. To counteract this difficulty I have a bulb at the end of a long flex, attached to a battery, and lower the bulb down the cavity.



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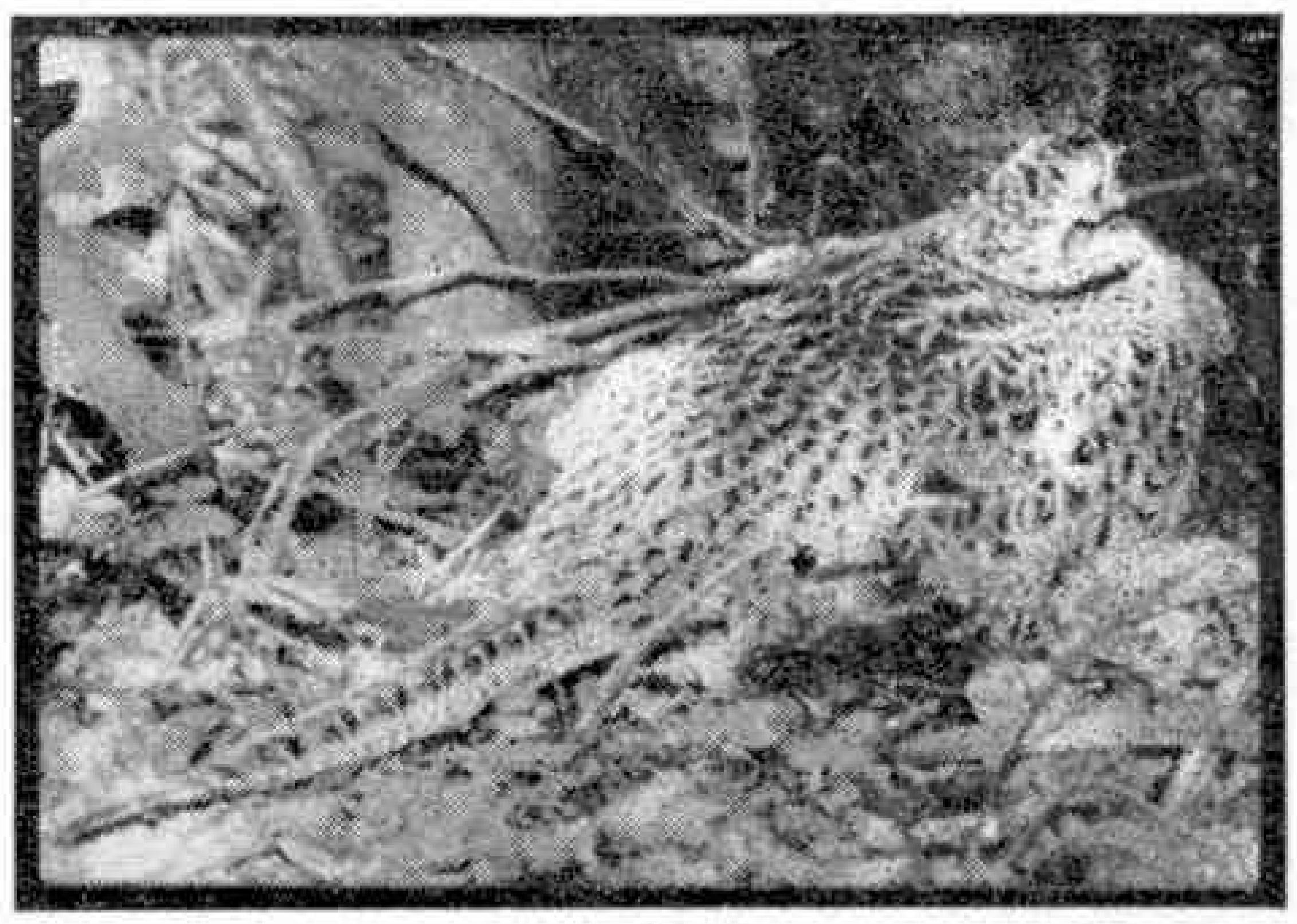
Some birds prefer not to nest in trees, bushes, cavities or hedgerows, but on the ground itself. As a rule they are not clever architects and are content to merely add a few stalks or stems to a slight hollow or depression in the soil in which to lay their eggs. Lapwings, curlews, nightjars, snipe, partridges, woodcock and many others are ground-nesting species and when I first began bird-watching I thought nests on the ground would be quite easy to locate, but I was mistaken. Ground-nesting birds choose sites where their coloration harmonises so cleverly with their immediate surroundings that when covering their eggs even the most experienced eye could fail to detect them as distinct from their environment. Indeed, the 'camouflage' is so remarkable that I have stood within a few feet of sitting snipe and woodcock and not seen them.

What is even more remarkable is that, although I have even located nests on the woodland floor, on moors and marshes, when I have gone there a second time I have not been able to find them. The owners seem to realise that their protectively coloured plumage serves them in good stead and in order to take full advantage of it remain as still as statues until almost stepped on. The most classic example of this is undoubtedly the nightjar which closes its large black eyes (typical of all nocturnal creatures) to a mere slit of vision when anyone approaches so that its prominen optical organs may not betray its presence.

4

Walking about searching for nests on the ground often involves hours and causes tired feet. A better way is to enlist the help of another bird-watcher, and with one of you at each end of a long, heavy rope pull it slowly across the ground. As soon as it touches the bird she will immediately take wing. Drop the rope, and by walking along the length of it you will probably discover the secret the bird tried so hard to conceal.

If, however, no bird-watching friend is at hand and you would rather not share the secret with others (it's never wise to do this except with those whom you can trust) you can employ this method single-handed by pegging the rope down at one end; but not for a single moment dare you raise your eyes from the ground you are searching. When eventually the bird is flushed, tread carefully because the eggs of ground-nesting birds are also protectively coloured and unless you move with the utmost care and caution you could easily tread upon them. I once had the misfortune to do this and the horrid sound of four lapwing's eggs crunching beneath my foot haunted me for months.



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Now, although many bird-watchers enjoy their hobby without companions, there is much to be said for belonging to a club where, at the close of a day's or a week's observations, you can discuss your findings and experiences with others. Many such clubs have been formed in schools or among a few friends where each will have much to share with the others.

I realise, of course, that not all memories are as faulty as mine was when I was a youngster (it's infinitely worse now) but a notebook was an absolute essential for me. My method was to devote a page to each species and record the situation of the nest, the materials used in its construction, the number and description of the eggs, whether both sexes or only female incubated and for how long, the menu on which the nestlings were fed, whether both parents participated and at what age the young left home.

The real thrill of bird-watching lies in the fact that nobody knows what a day's adventures may reveal, and it could as well be your good fortune as anybody else's to make some amazing discovery which would add valuable data to the annals of natural history.

1

Hollow trees attract owls, and here a tawny-owl is about to leave home, watched by her family, to forage for rats and mice for supper.

2

Watch a bird with its beak crammed full of food. This blackbird is pausing for a moment while on her way back home to feed her young.

3

The pheasant chooses the base of trees to aid its protective plumage.

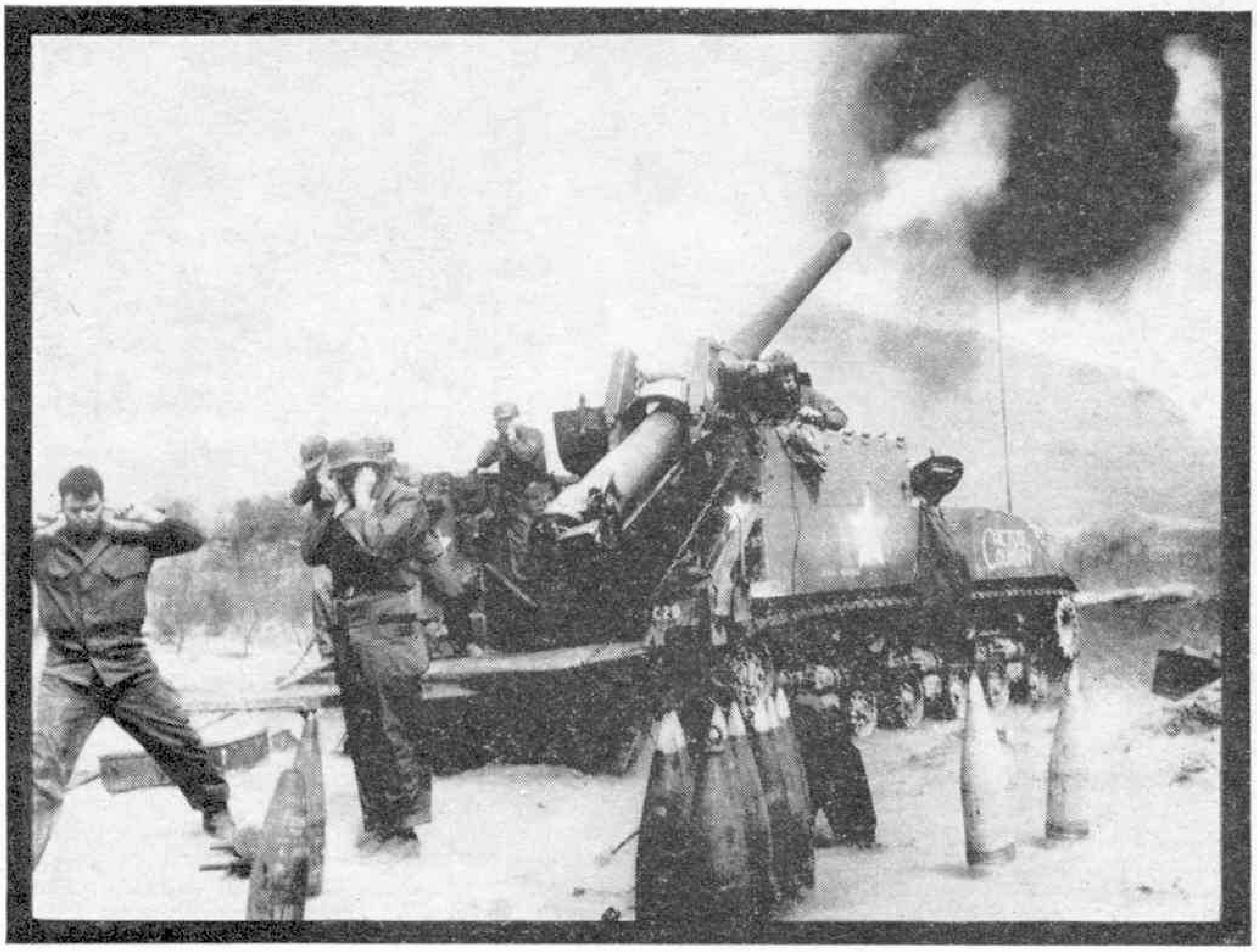
4

A greater Spotted Woodpecker, seen here with food for her family.

TABLE TOP BATTLES

Battlegaming Models

By H.L.D.



IN February, the layout of the different Armies' divisions was given. From this we saw that the only readily available items of equipment with which the Battlegamer can equip his American forces were the Airfix models of the Sherman tank, Jeep, and M.3 half-track. Now, however, the ROCO Minitanks range is becoming increasingly available, and we can turn to their catalogue to see what is suitable to use in the 00 (1/76) scale for the World War II period. Luckily for the 'American Army', here we find all the artillery pieces we could wish for.

First, we find the 155 mm. Self-propelled Gun M.40 (ROCO No. 104). Before dealing with the model itself, here is a brief historical note. The M.40 was developed from an earlier 155 mm. SP Howitzer M.12 'King Kong' that had appeared in 1942. The M.12 chassis was that of the Sherman tank then in production, thus it had the original vertical volute suspension similar to that on the Airfix model of the Sherman. When the famous 155 mm. M.2 Gun 'Long Tom' became available it was decided to increase its mobility by mounting it on a suitable mobile carriage, and the latest Sherman chassis was adapted. This featured the horizontal volute suspension and wider tracks which account for the different appearance.

The M.40 entered service with the American artillery batteries attached to Central Command, in 1944. It served on all fronts and was again in action in Korea from 1950 to 1952. It was finally replaced in 1955 by the M.53 which is also represented in the ROCO range (No. 157). Some M.40's were used by the Royal Artillery, and one example is on display at their very interesting artillery museum at the Woolwich Arsenal Depot in South London.

This M.40 is one of the early models of the ROCO range, and is somewhat lacking in detail when compared to their recent issues. (Fortunately it is modelled to 1/80 scale, which is almost the same as 00 scale.) The main deficiencies are the missing buffers on the gun and the most important recoil spade. This spade prevented the running gear and suspension from being damaged by the recoil of the gun. The basic model costs 2s. 6d., but for an additional 2s. 6d. and the minimum of work, we can make it into a perfect replica of the prototype. Acquire one of the modern 155 mm. SP guns (No. 136), as it has a fully detailed spade and gun. From this the gun is removed and the circular platform and seats are cut away. Next carefully remove the rear 6 mm. of the gun mounting, which should leave the gun as shown in the photograph. A shield, for the gun layer, is made from a piece of Plastikard and cemented on the left-hand side of the gun mounting. The original gun can now be removed from the M.40 and the new one stuck in its place. I do not think it worth the trouble trying to reproduce the traverse in such a model, but if this is required, the gun section of the 'Long Tom' model (No. 120) can be substituted. This, however, does not represent the best solution as the gun is not quite the same as the one on the real M.40 and it still costs 2s. 6d., leaving you without the spade mechanism.

Carefully remove the spade, making sure not to break any of the brackets. Take the two angled stays and cut away the single end pivot. Cement them back onto the spade the opposite way, so that the straight members are closest together. Cut 4 mm. lengths from the thin portion of the hydraulic rams and cement these vertically in the attachment points, where the thick ends were attached. Now cement the unit on to the base of the tail platform, making sure that, when this is lowered, the spade rests upon the ground. When set, the model can be painted and markings applied, leaving us with a highly detailed reproduction.

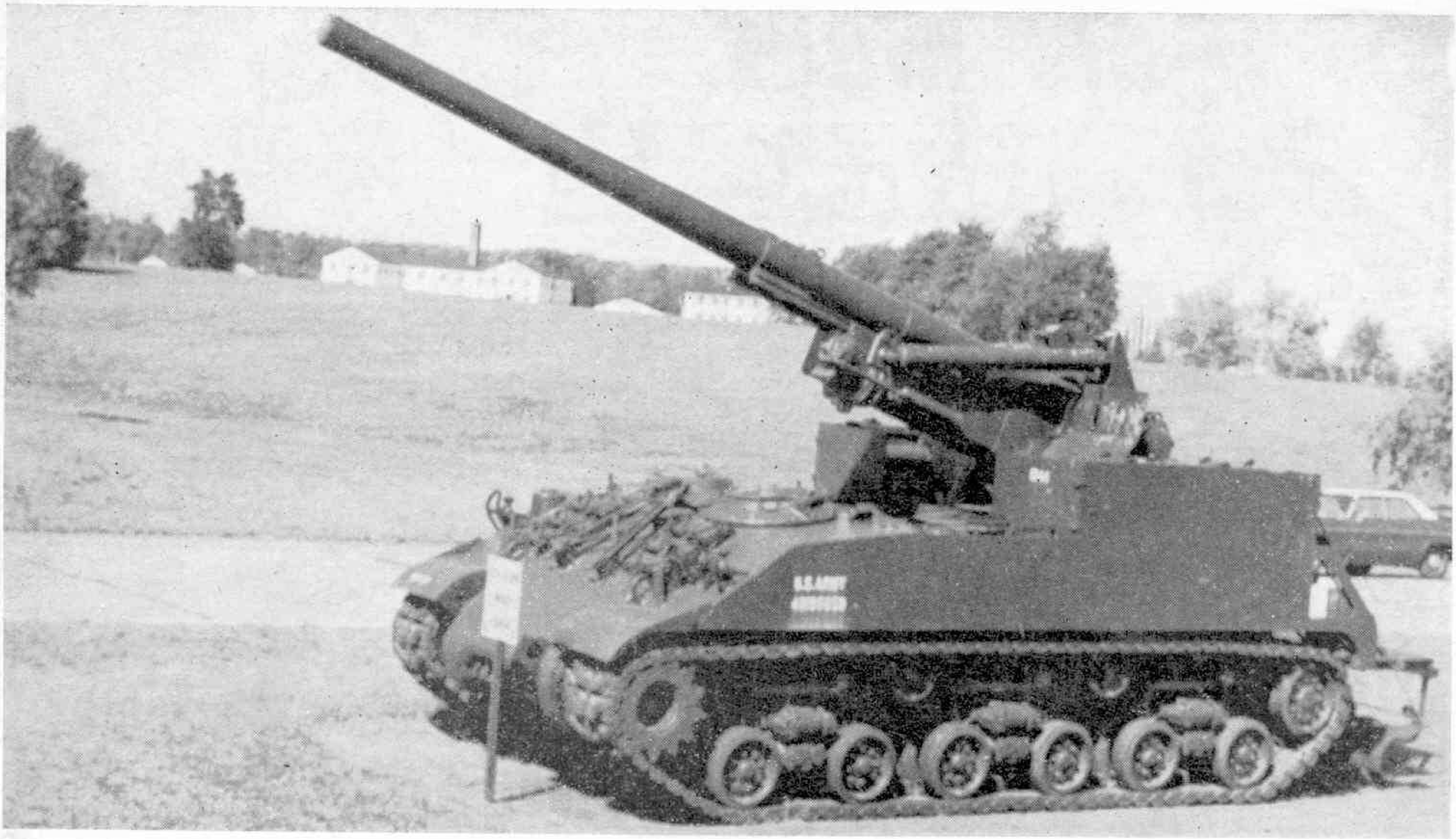
Every country has had its famous weapons, and when reproducing a model army it is necessary to include some of these more famous pieces, or the whole thing would seem wrong. Just as we could not have a British army without a 25 pounder gun, the Americans must have 105 mm. Howitzers. Luckily, we Battlegamers have been saved much work here as ROCO provide a wonderfully detailed model (No. 183) of this gun. It is fully operational, the trails split, the barrel elevates and traverses just as with the real thing. All that is needed is a coat of paint. This model scales about 1/80 so at 1s. 6d. is an excellent buy for an 00 scale army. The towing vehicle for these Howitzers is the M.3 half-track, as modelled by Airfix.

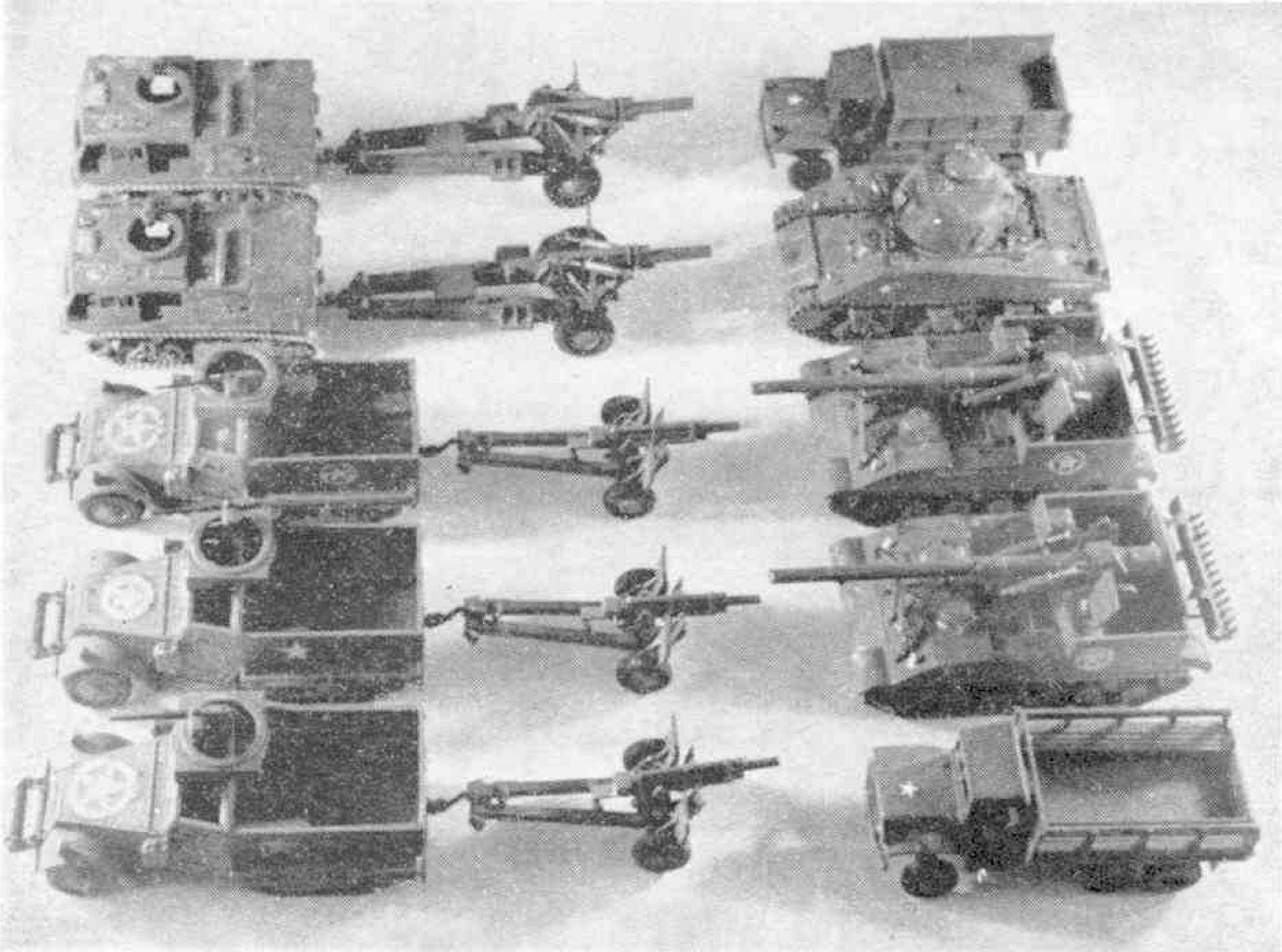
The M.2 105 mm. Howitzer was first introduced into service in 1935. It was the result of careful development of the model M.1 which appeared in 1928. The M.2 served throughout the War and later in Korea, without undergoing any major changes. It was capable of firing a high explosive shell weighing 33 lb. a distance of 12,500 yards. In 1942 the SP version, 'Priest' M.7, appeared on the 'Grant' tank chassis and these were used by Montgomery's force at the battle of El Alamein.

Another ROCO model which scales 1/80 is the American field Howitzer, 155 mm. M.1 (No. 187). Costing 2s. 6d. this highly detailed model is an excellent buy. Not only does the trail split, but the spades can be detached and carried on the side of the trails during travel. There is a travel steady that locks the barrel straight and a large jack that holds the wheels off the ground for more stable firing. The barrel traverses and elevates, with the buffers working most realistically. The M.1 was used by the Americans and their allies until the late fifties. Shell weight was 95 lb. and this could be fired a distance of 16,350 yards. For a towing vehicle ROCO M.4 tracked prime mover 'High Speed' 18 ton (No. 178) is based upon the chassis of the M.3/M.5 series of light tanks which entered production in 1942. They served in Europe from 1943, and usually towed the heavy 'Long Tom' and 203 mm. Howitzers. As can be seen from the photograph of the models prepared for this article, we have two 155 mm. M.1's, towed by M.4's to represent the heavy artillery battalion of the U.S. Infantry Division. The three 105 mm. M.2's towed by half-tracks represent the medium battalions, while the M.40's are attached to this particular division for special tasks such as the laying down of a barrage before an assault. The M.4 Sherman tank is an artillery observation post. Such OP tanks are essential as they must go forward near the front line to observe fire and report targets back to the batteries. Two ammunition supply trucks are also provided.

Many Battlegamers feel that artillery is too complicated and powerful, so they just don't use it. However, this limits them to using certain arms only. In the long run it inevitably reduces the realism, for every army is open to long range attack by artillery at some time. We can use artillery in Battlegames by making it just a bit more difficult to use, thereby decreasing its apparent power.

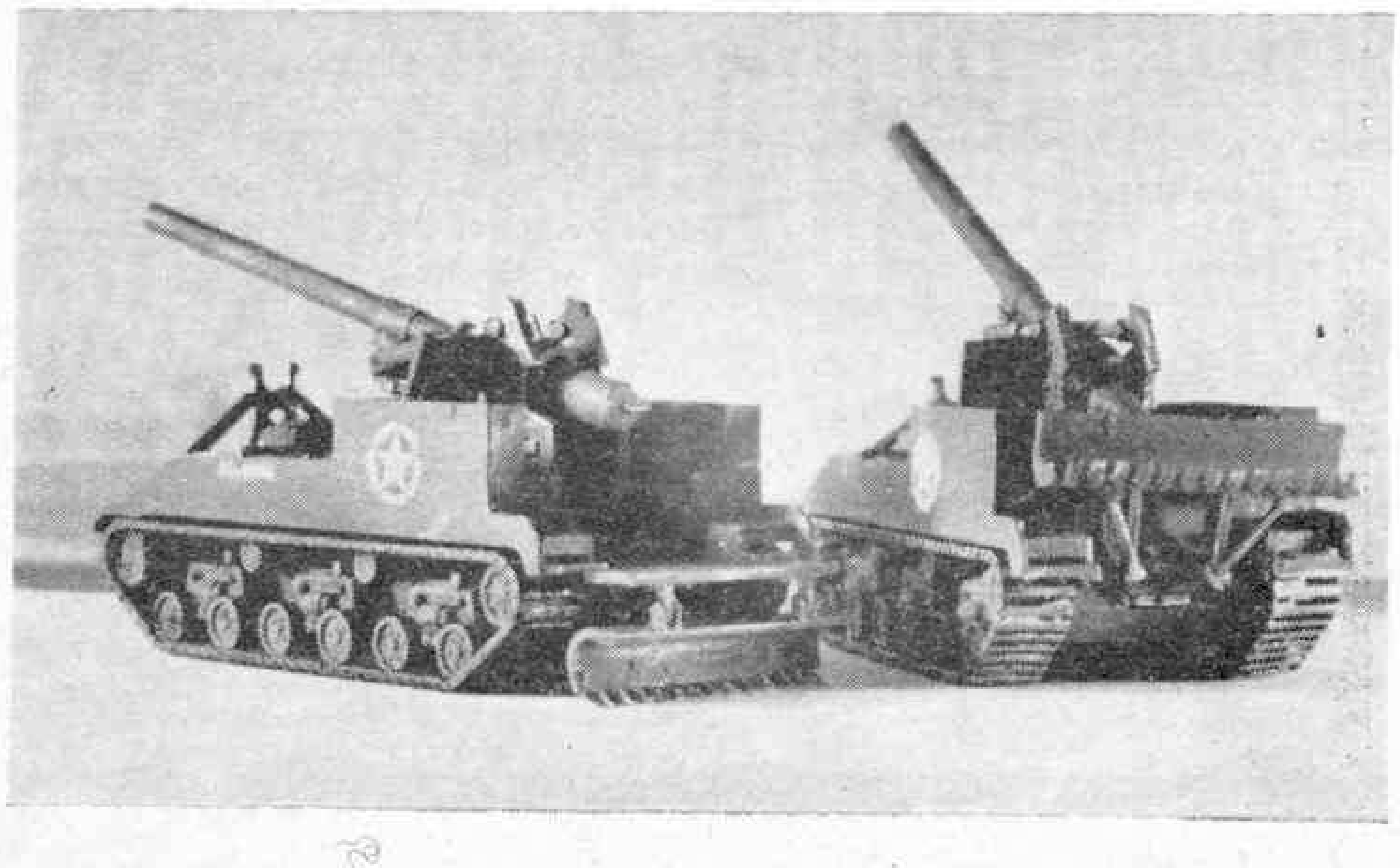
As shown last month no gun can fire more than fourteen inches. This is what we assume to be the maximum range of direct vision. To fire further, the gun must be layed with the help of information passed on by an Observation post not more than fourteen inches from the target. Again we assume each OP can signal only eighteen inches, but information can be passed on by different posts, thus increasing the range. An artillery piece is fired, as explained before as follows: indicate the target, and let the dice decide (one dice only); above four, a complete

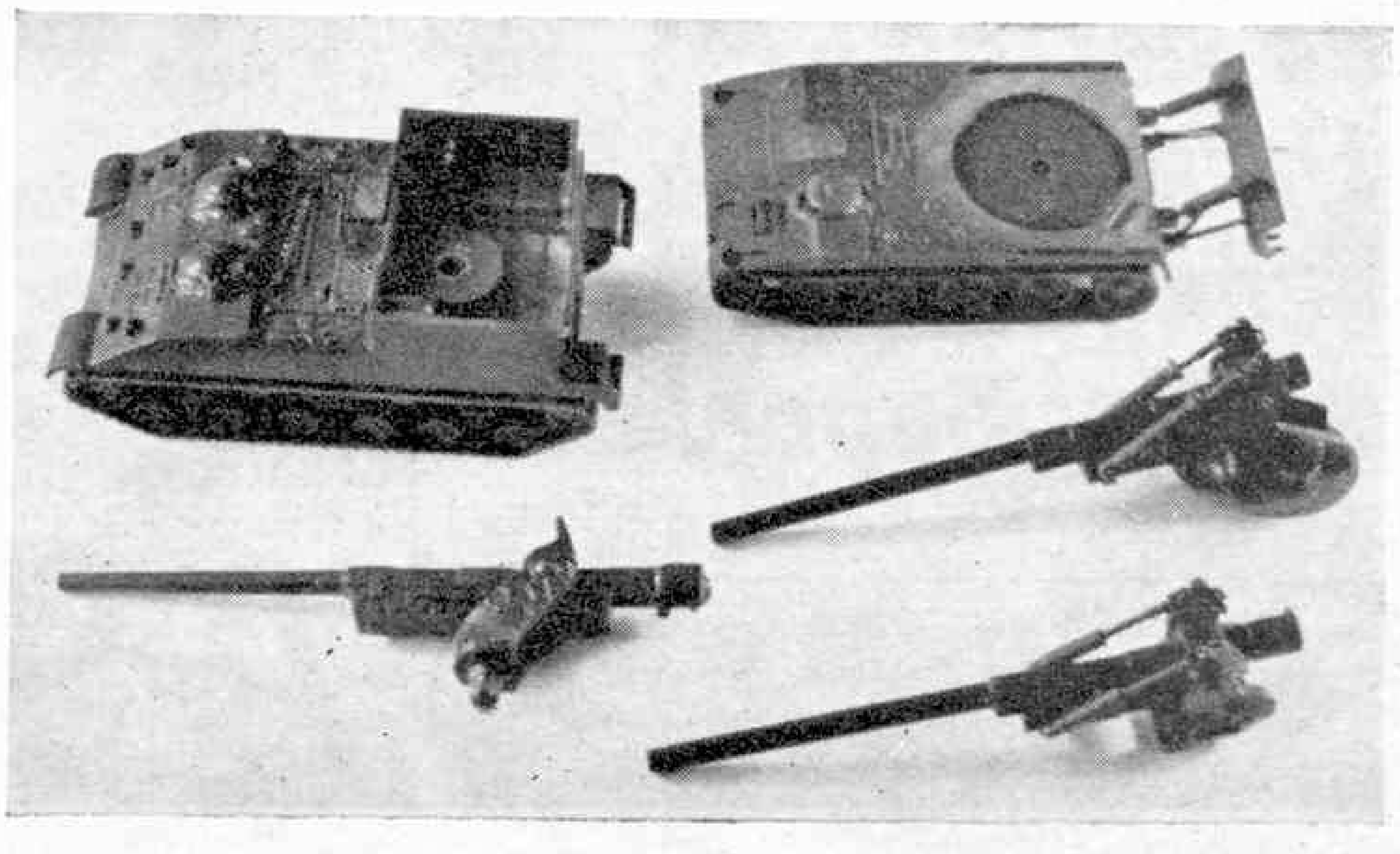




hit; three, blast damage only, and below three, a miss. A one inch diameter circle is the area of damage caused by a 105 mm. or 25 pounder. Their ranges are from zero to twenty-one or twenty-three inches respectively. The 155 mm. M.1 and 5·5 inch Howitzers have a similar performance; a three inch damage circle and a range from six to twenty-five inches. The 155 mm. 'Long Tom' of the M.40 is the same but has a range from ten to thirty-four inches. The towed guns take one move to prepare for firing, as does the M.40 (a towed 'Long Tom' would take considerably longer). The medium field guns can fire once every move but the heavy ones only every alternate move.

Opposite page: an M.40 SP 155 mm. ('Long Tom') in action in Korea, 1950.
Top: an M.40 on display at the American Armour Proving Ground, Aberdeen, Maryland (Warpics photo).
Left: the completed divisional artillery of an American Infantry division, as described in the text.
Below left: rear view of two improved M.40 models showing details of the spade fitting.
Below right: the basic ROCO model of the M.40 with its gun removed. On the right is the modern SP carriage from which we get a detailed gun and recoil spade. In the front right is the gun modified to fit the M.40.





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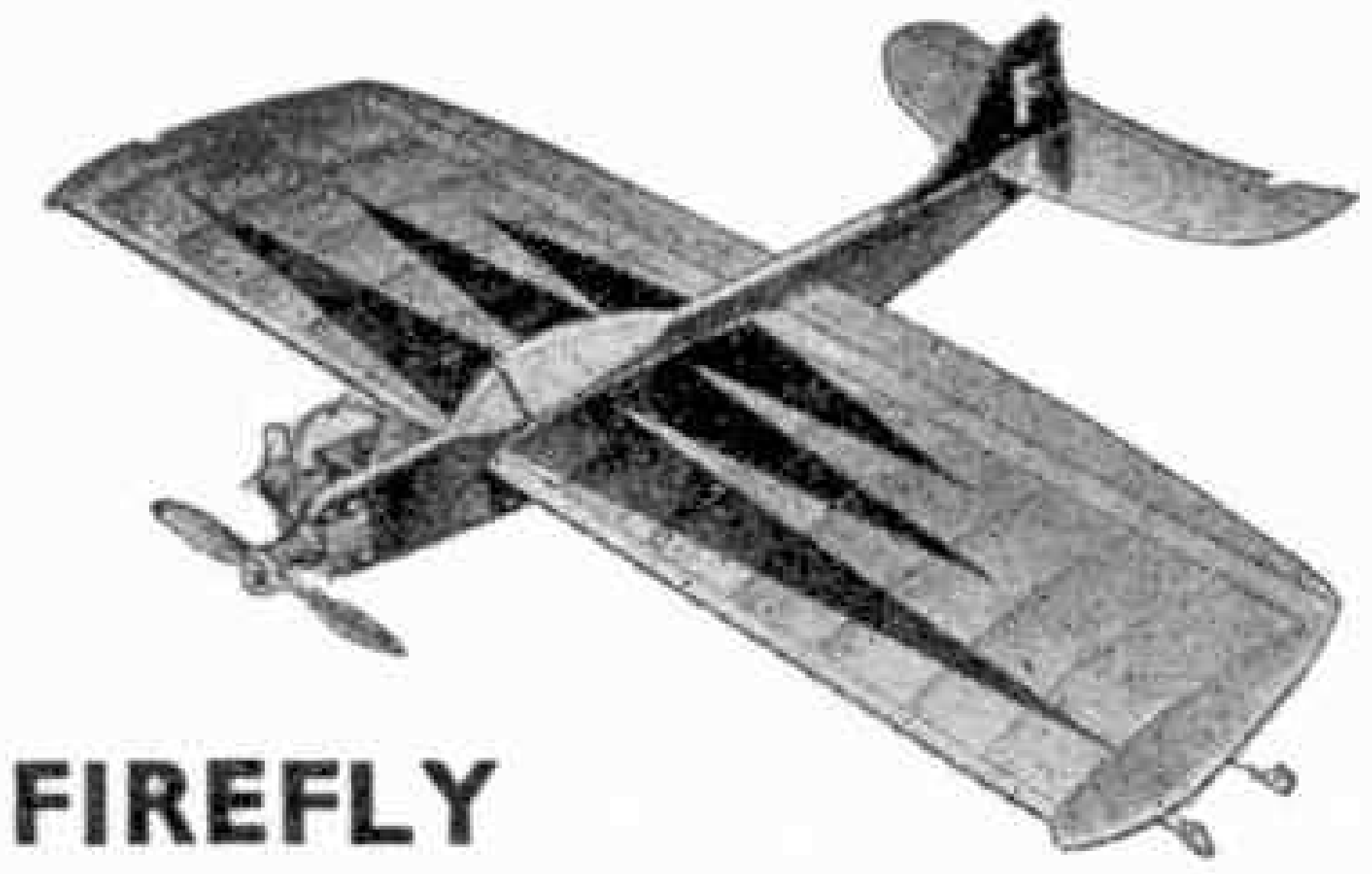

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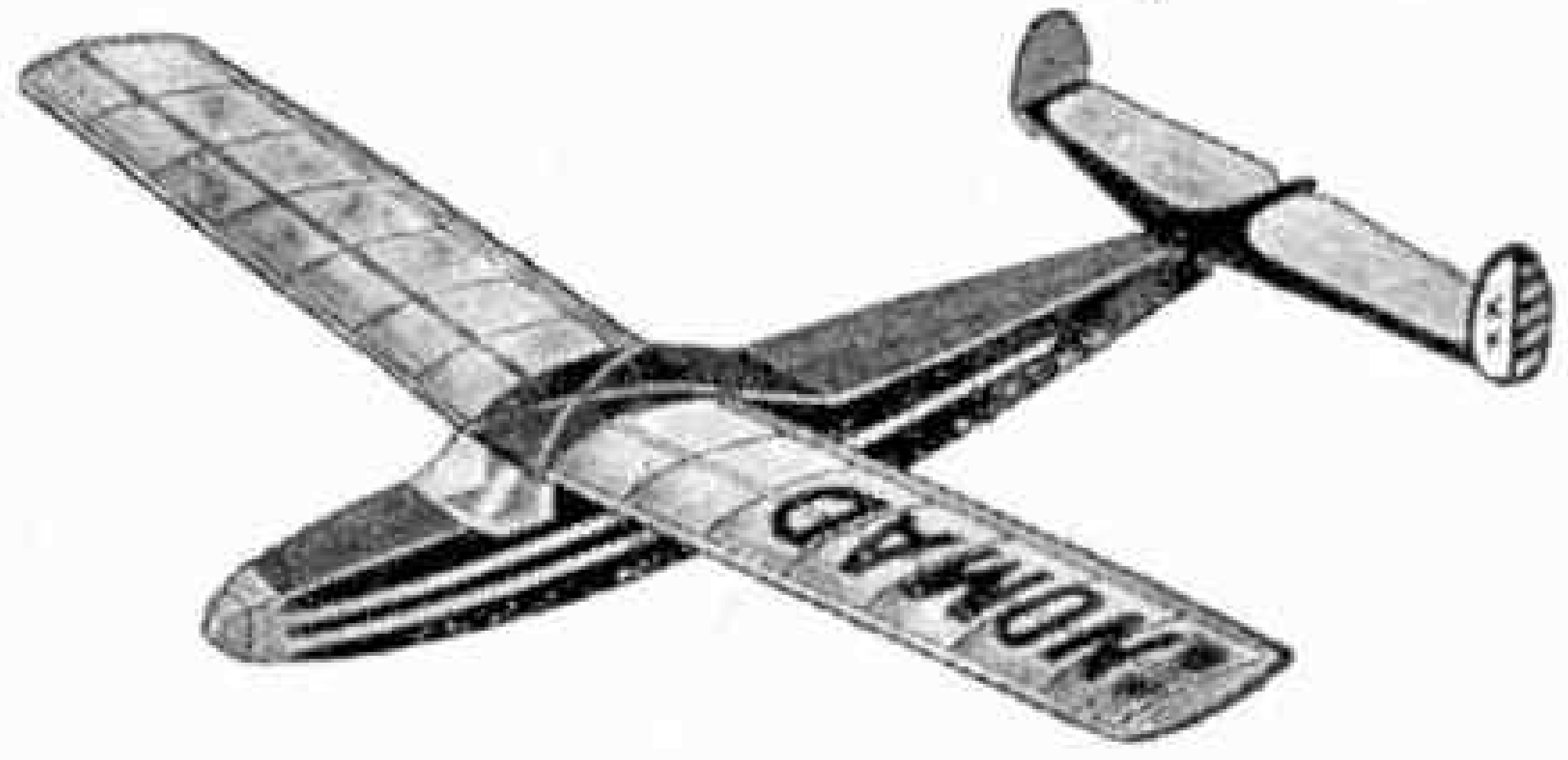

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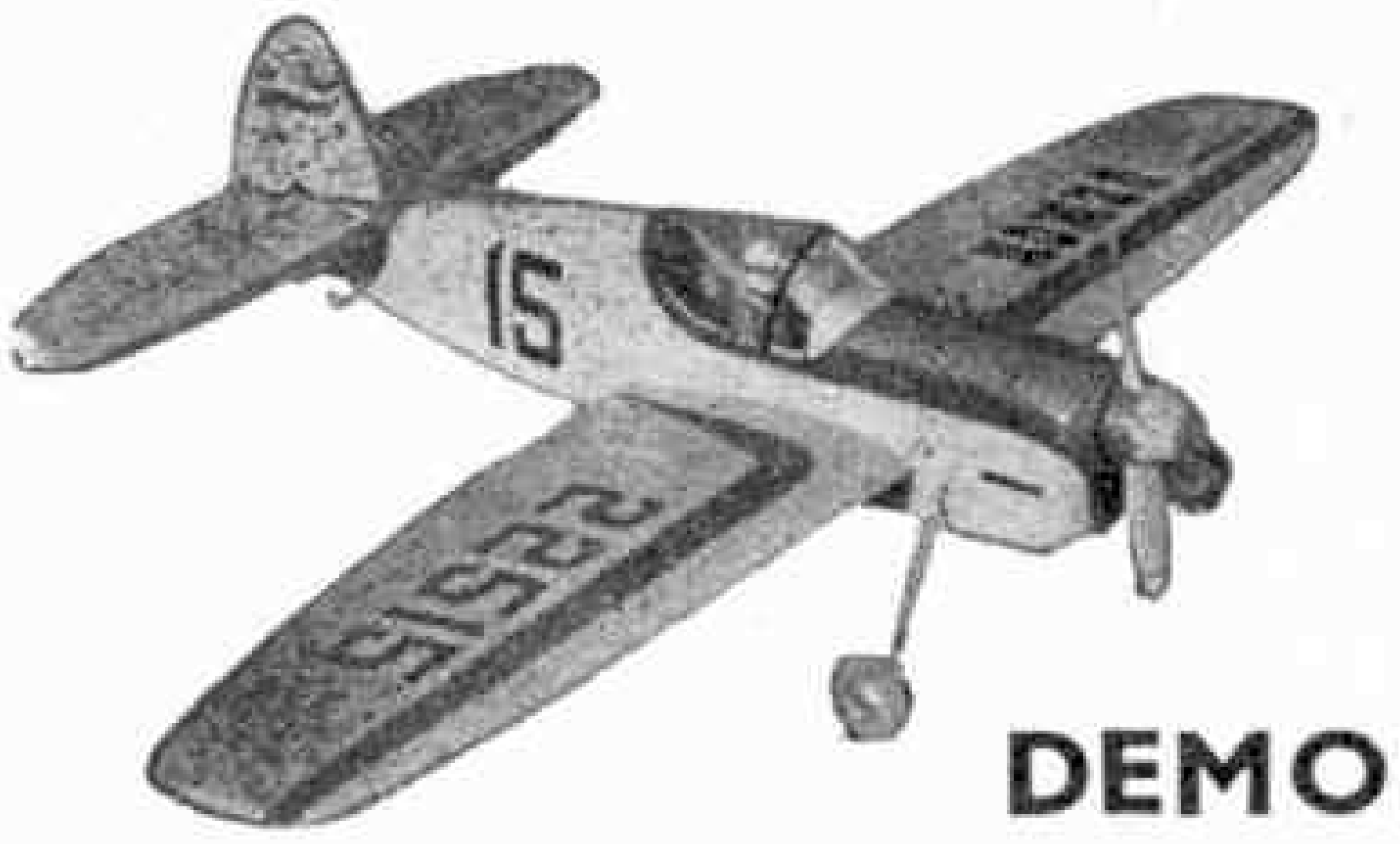

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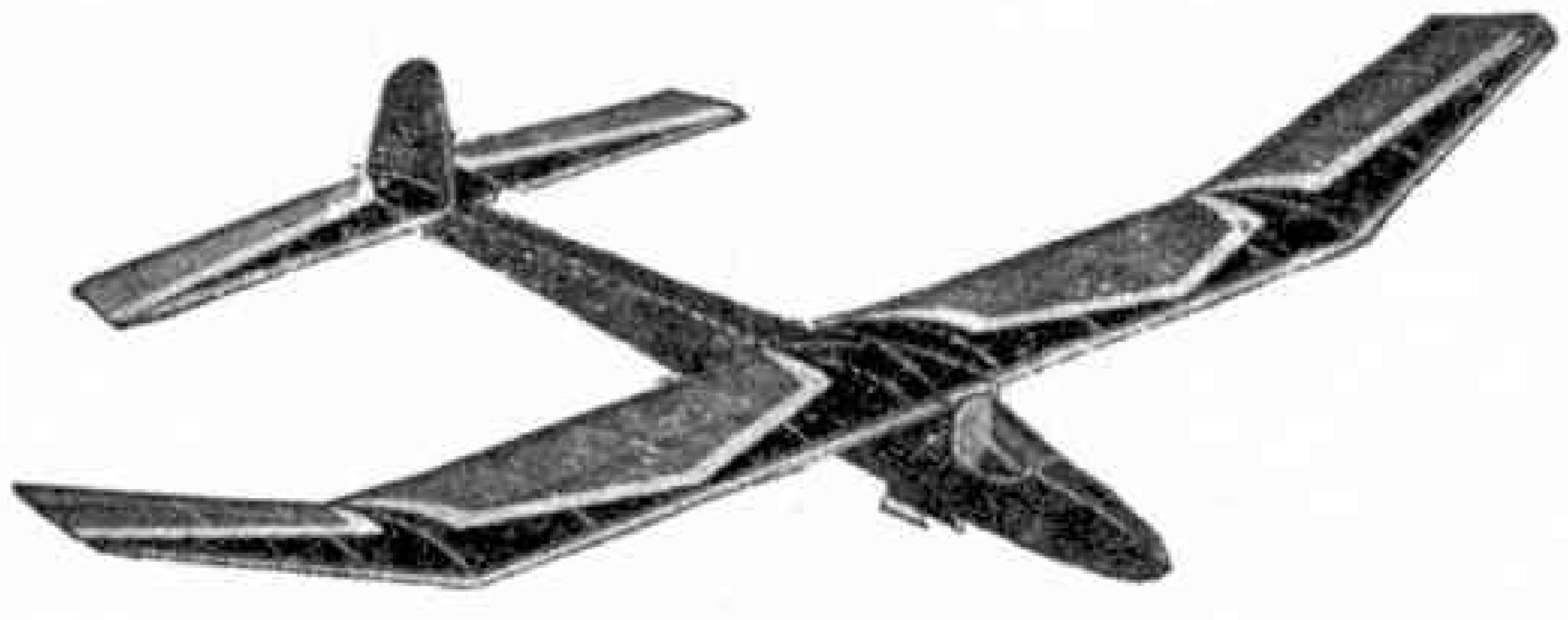

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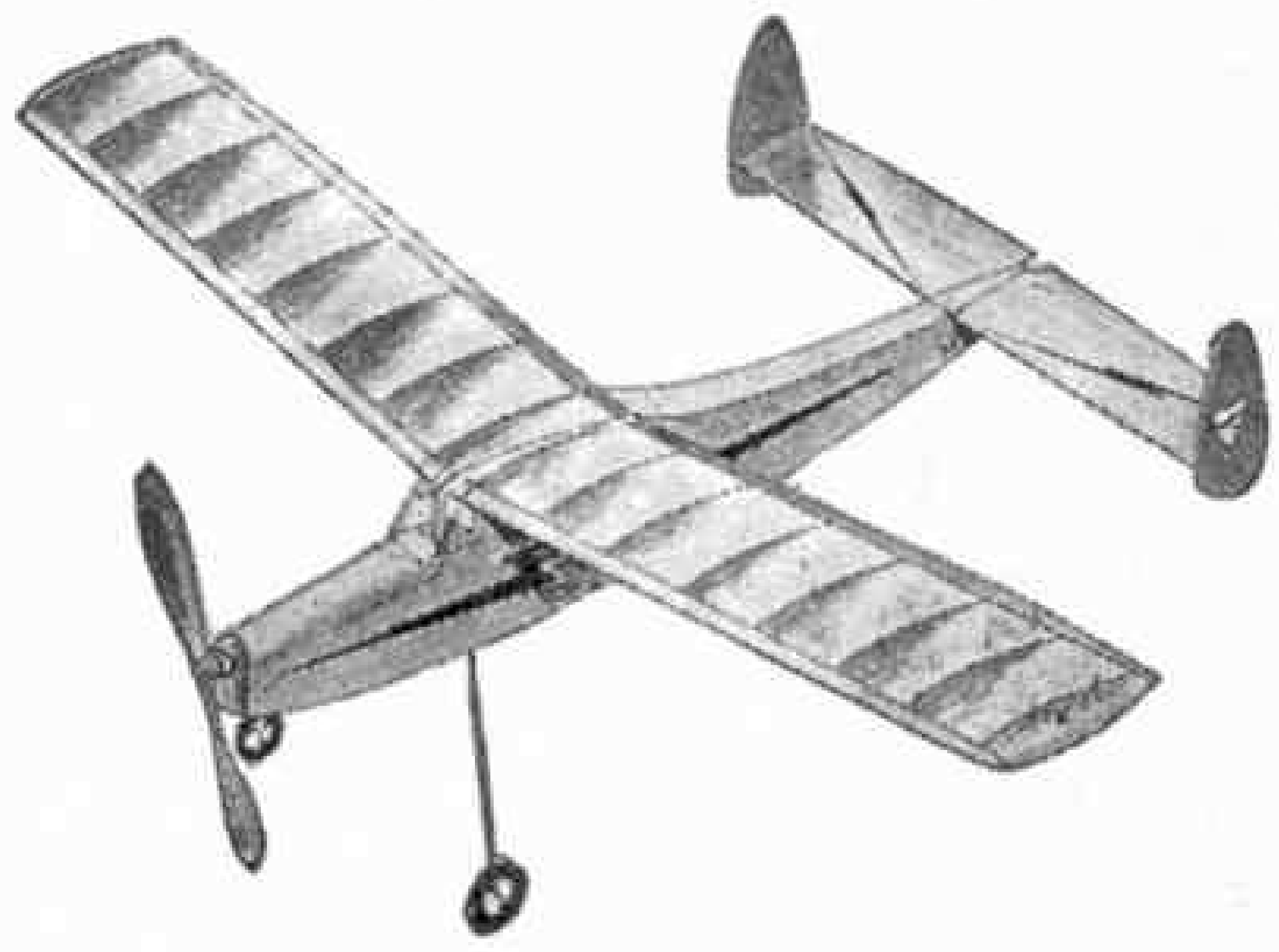

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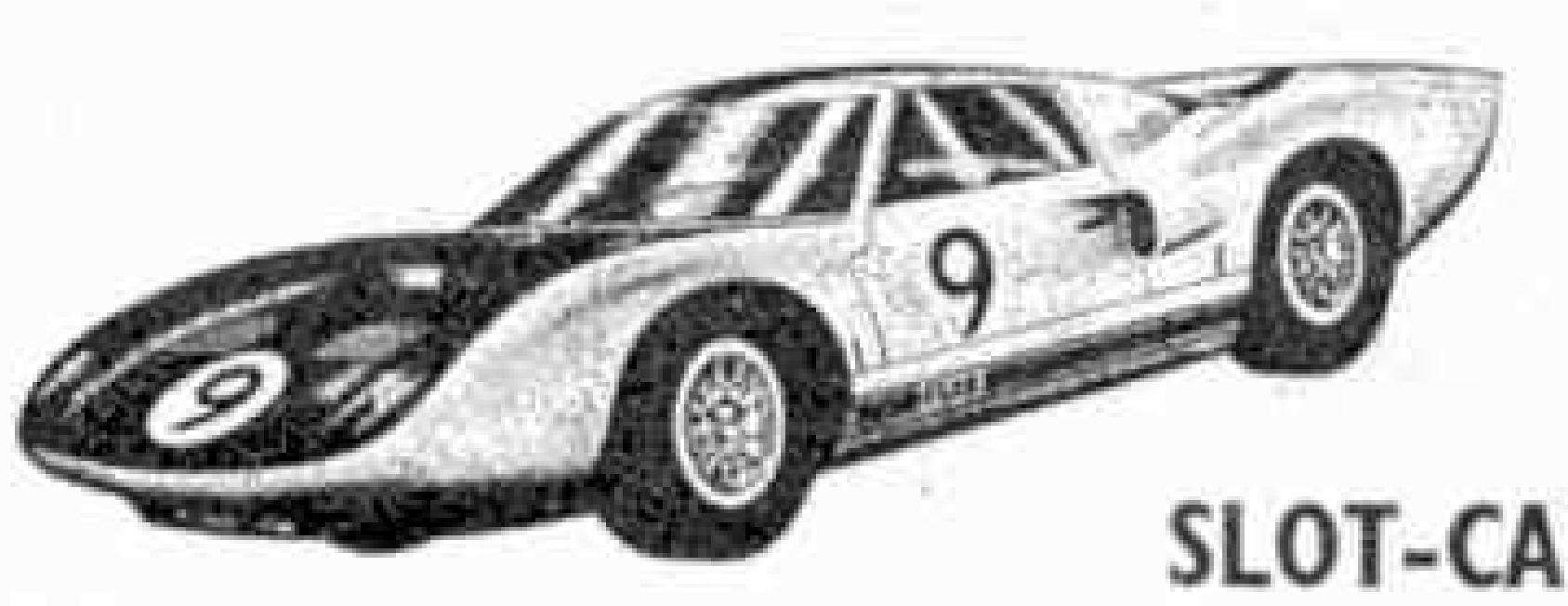

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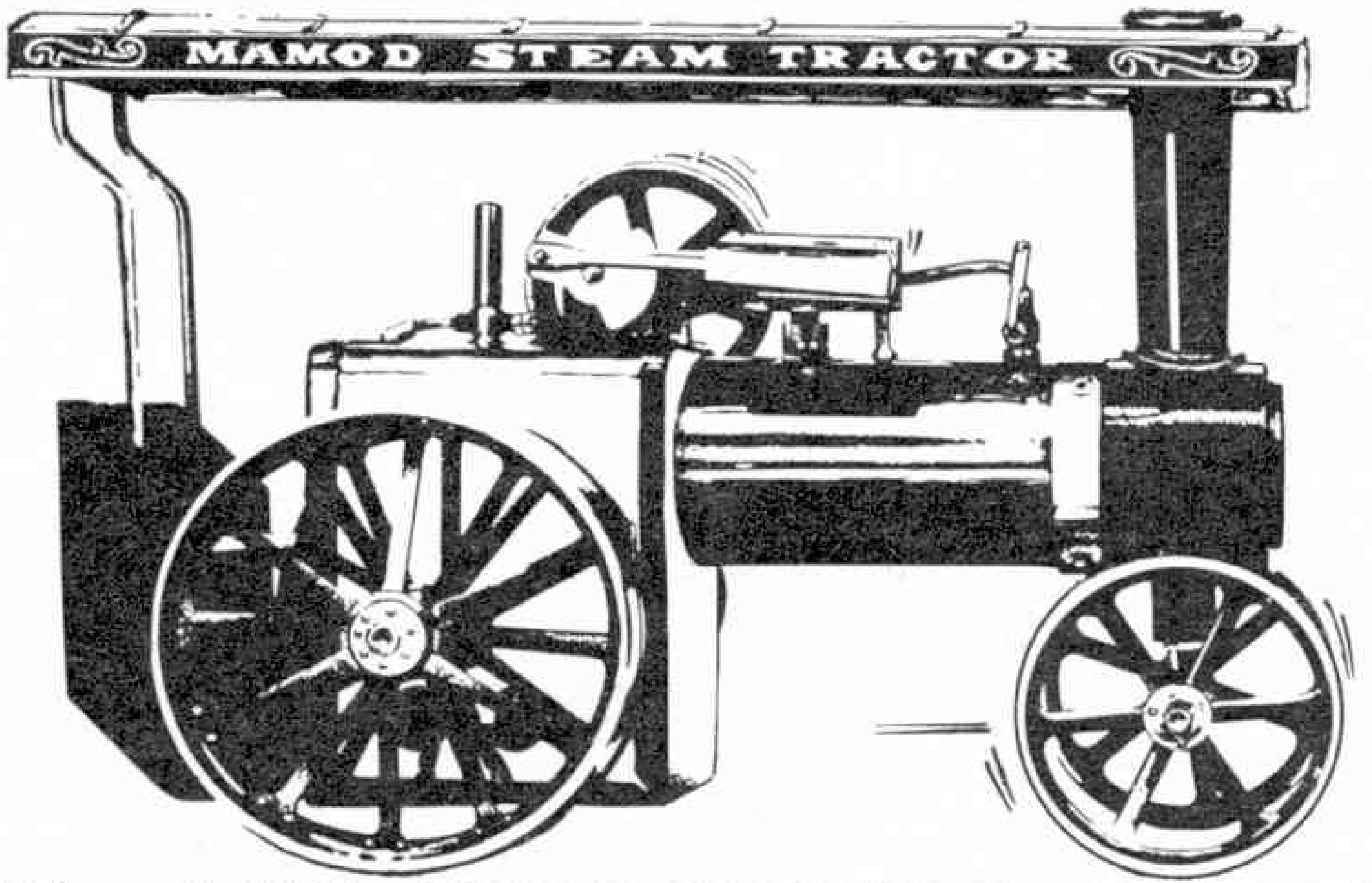

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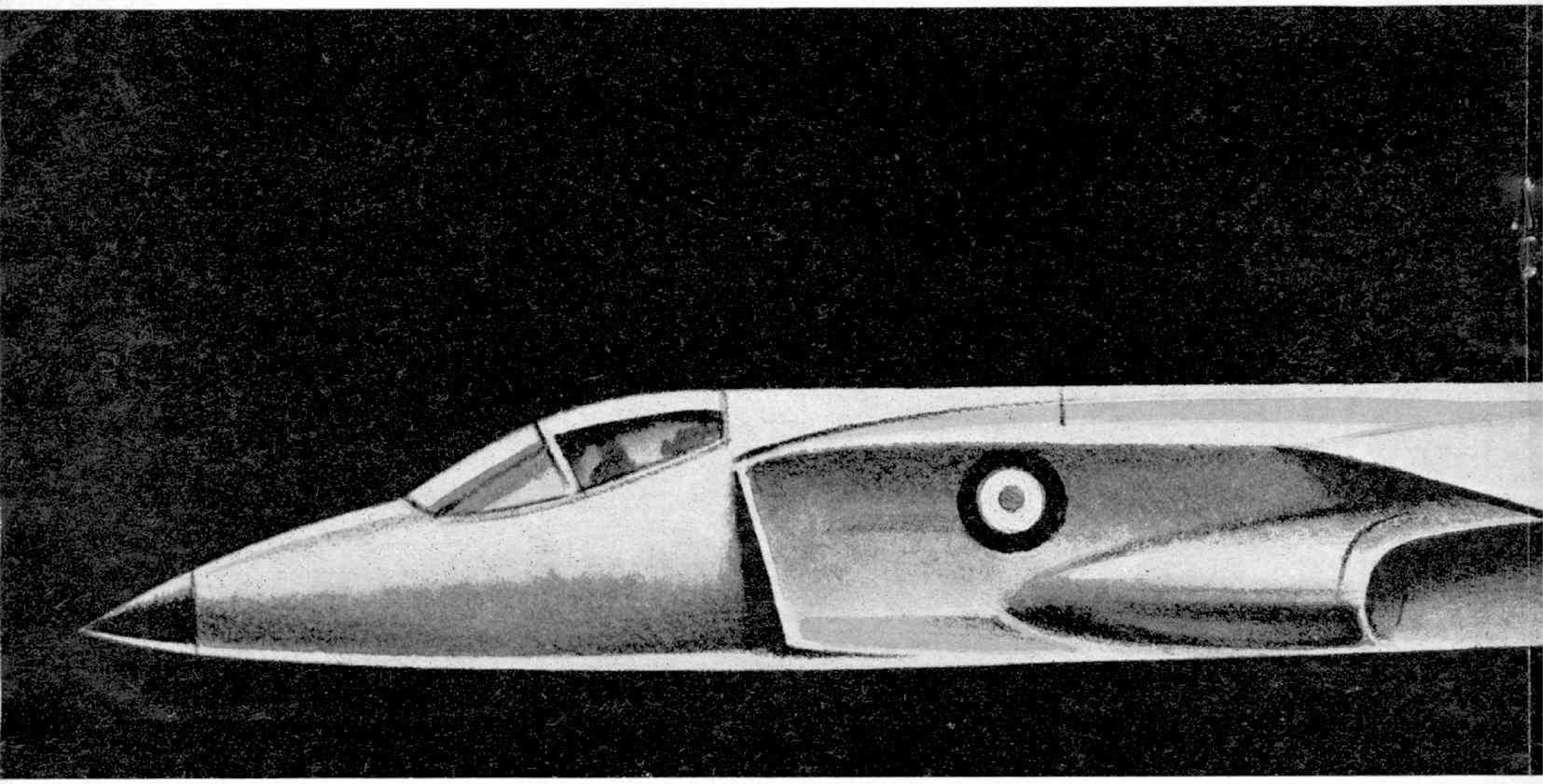
WORLD BEATERS

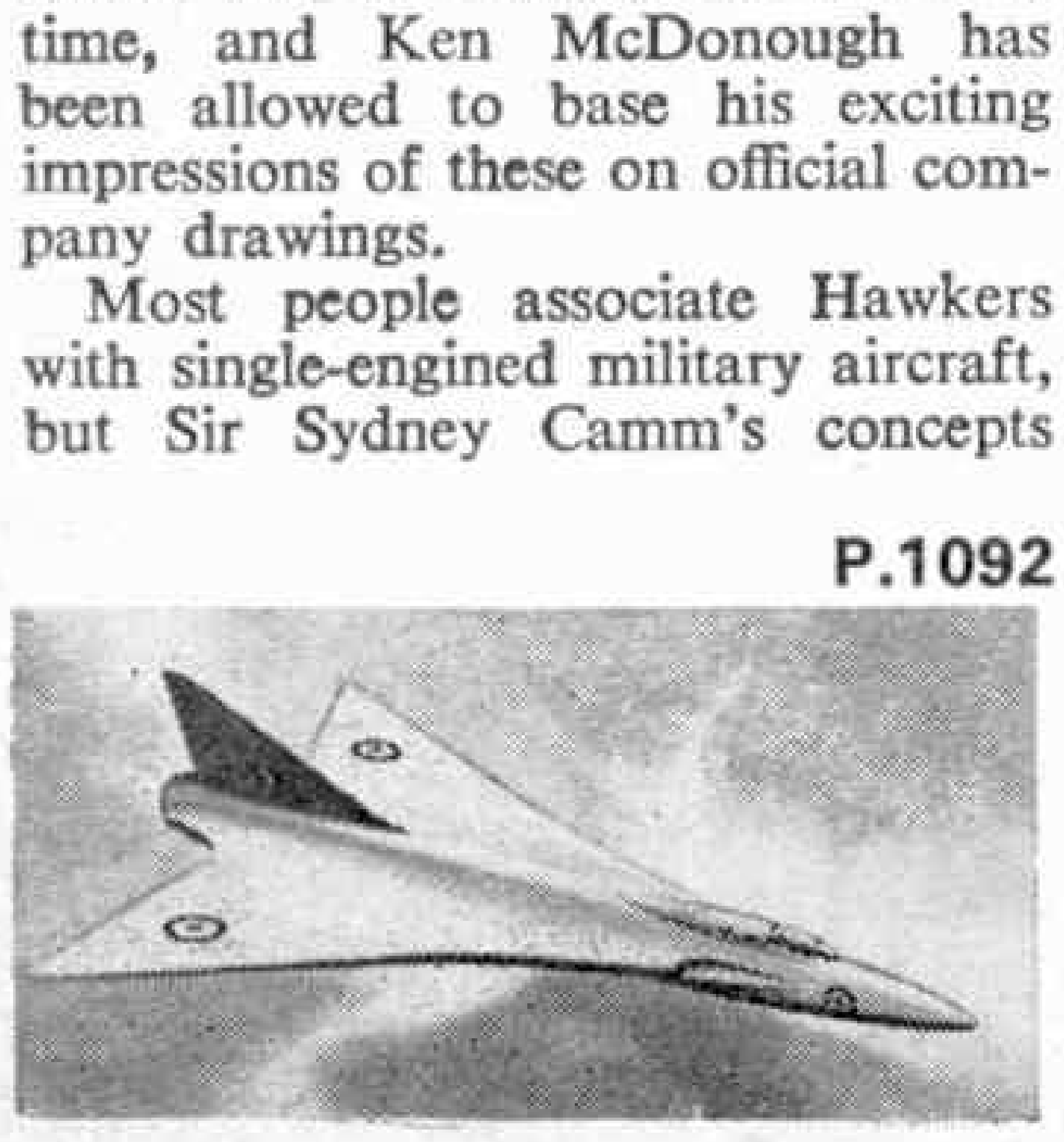


ON pages 18 and 19 of this issue of *Meccano Magazine* are shown models of some of the best-known products of the Hawker company, developed during the four decades when its design team was headed by Sir Sydney Camm. By modifying the basic kits, a keen model-maker could form a collection of well over a hundred different types and variants in the insignia of many air forces. But there are some Hawker designs that will never be included in any series of plastic kits, although they were among the most interesting and advanced of all. This is because, for one reason or another, the full-size aircraft never flew.

In this article, I propose to tell you about a few of these potential 'world-beaters that weren't'. Some have been described briefly before; others will be revealed for the first time, and Ken McDonough has been allowed to base his exciting impressions of these on official company drawings.

Most people associate Hawkers with single-engined military aircraft, but Sir Sydney Camm's concepts ranged far wider than this. The first aeroplane he designed for the company in 1924 was the tiny Cygnet ultra-light biplane which won the first prize of £3,000 in the Lympne Light Plane Competition of 1926. 'Ultra-light' was no exaggeration: the Cygnet carried two people on only 34 h.p. and had an empty weight of 373 lb.—less than the weight of one of the Sparrow air-to-air missiles carried by a modern fighter like the F-4 Phantom II.

P.1092



In the year of the Cygnet's triumph, Camm went to the other extreme and designed a big three-engined military transport for services with the R.A.F. in the Middle East. He followed it with a twin-engined heavy bomber to Specification B.19/27, but the Handley Page Heyford was chosen instead. Through the years, the Hawker design team continued trying to break into the multi-engined bomber market. Their P.13/36 monoplane bomber, drawn in 1936, was rejected in favour of the Avro Manchester. They came within striking distance of success with the beautiful Mosquito-like P.1005, designed to Specification B.11/41 and intended to be powered by two smoothly-cowled Sabres. Visitors to the Experimental Shop at Kingston in the early 40's cast admiring glances at the full-scale mock-up of this design, but it remained only an aeroplane of wood and paper.

The P.1005 reflected Camm's policy of having 'only gentle curves everywhere'. When the first of Sir Frank Whittle's Power Jets turbojet engines became available, a scheme was sketched out to fit two of them in the bomber, instead of Sabres. In the middle of a world war, the government decided that Hawkers were better employed on building piston-engined fighters by the thousand than in dabbling with still-unproven jets.

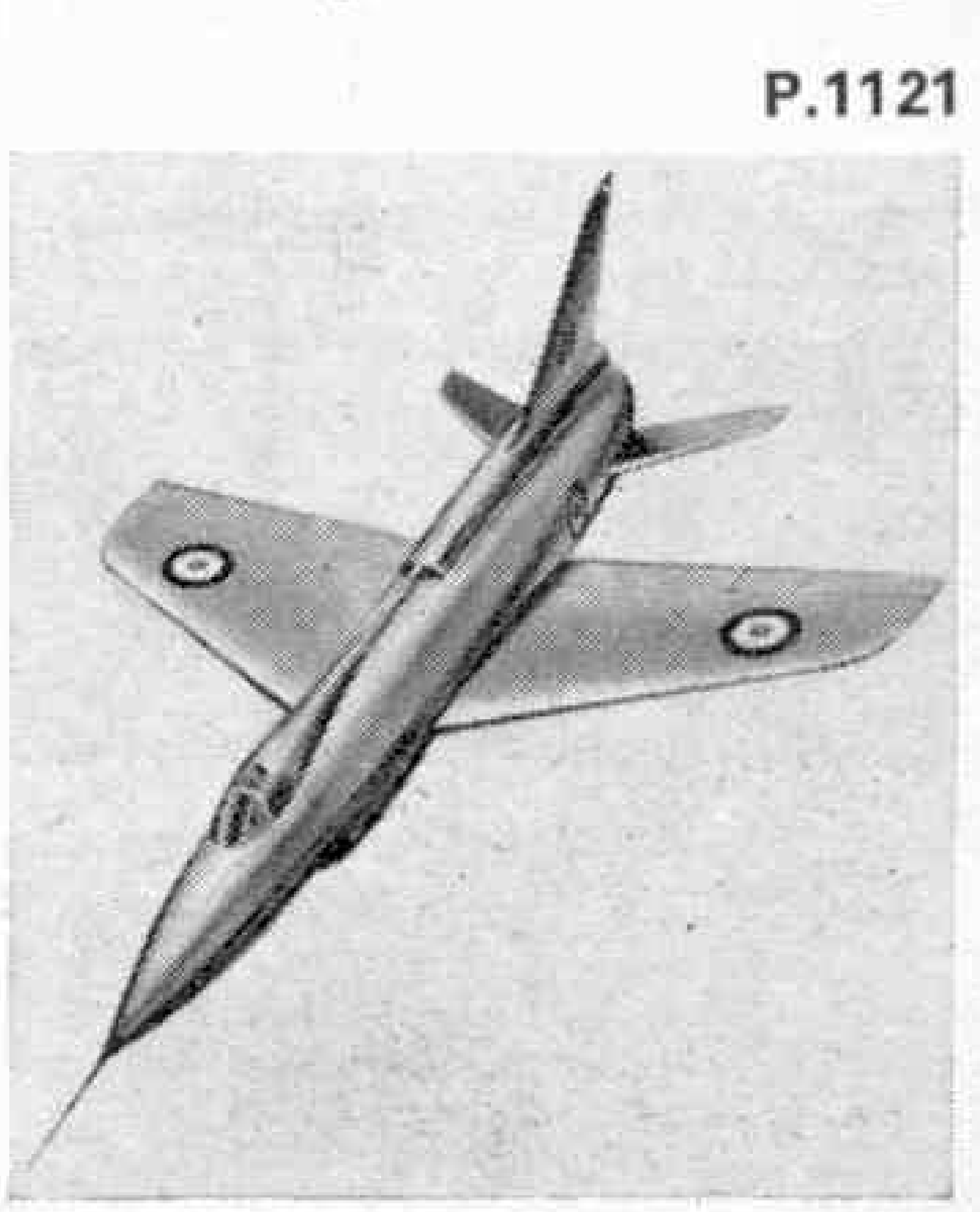
For Camm, however, the jet-engine—by eliminating the need for a cumbersome propeller—offered new design possibilities, and his succession of jet-fighters has never been excelled in terms of grace, beauty and flying qualities. The Sea Hawk, Hunter and P.1127 are famous, but how many people could identify the P.1092? Yet, if built, this might have outshone even the Hunter.

Today, delta-wing designs are no longer unusual; but when the P.1092 was conceived in 1951 only four types of powered delta had flown, all of them pure research aircraft. It took a great deal of courage, therefore, to design a delta that would not only be suitable for first-line service as an all-weather fighter, but would also be the first British combat aircraft capable of travelling faster-than-sound in level flight.

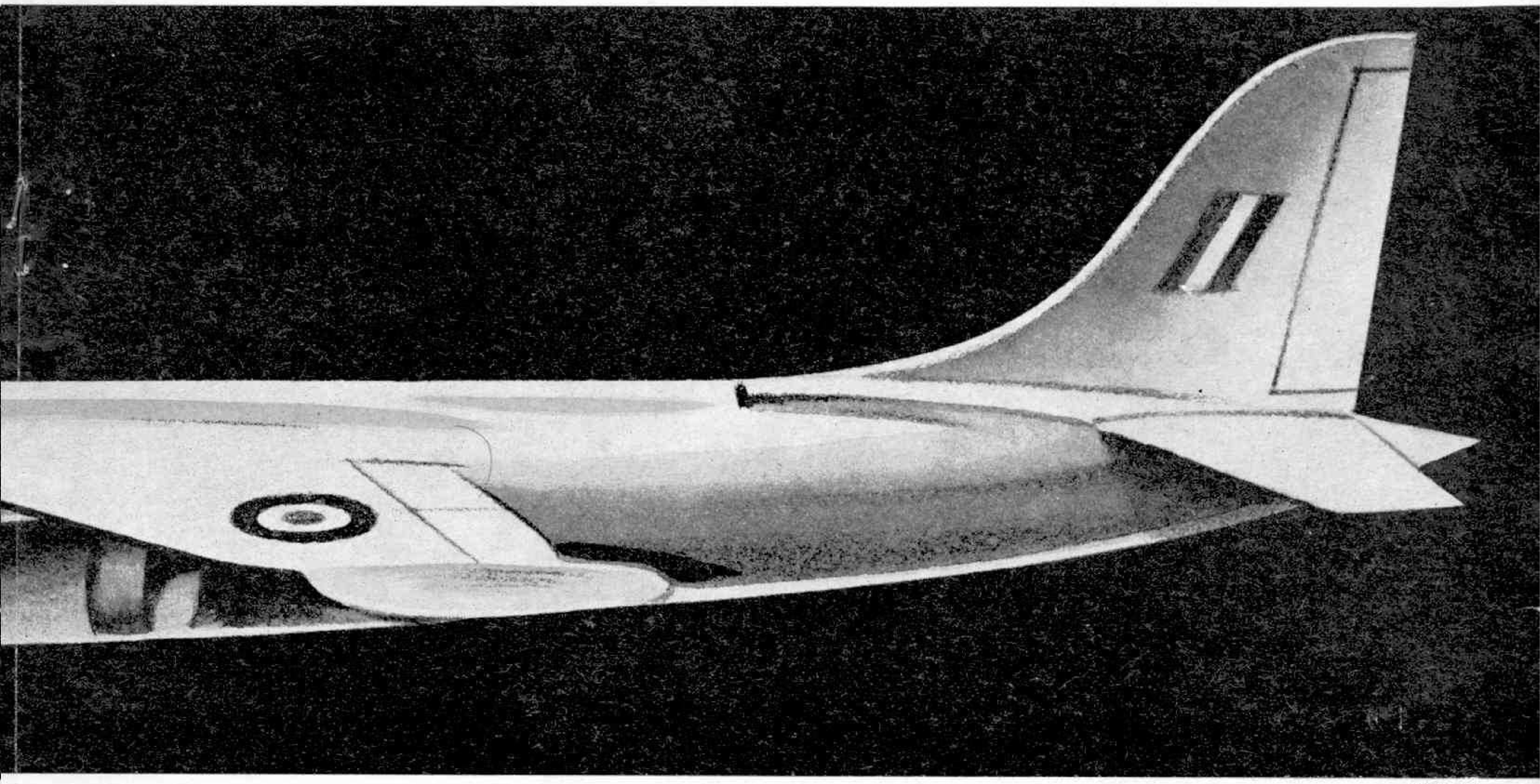
The wing leading-edges of the P.1092 were intended to be swept back at 65 degrees, an angle which is only now being adopted by other designers. Span was 35 ft. and length 55 ft. The power plant was to be a Rolls-Royce Avon turbojet. With the prototype Hunter about to fly, those in authority probably considered that Hawkers had their hands full, and the P.1092 was soon forgotten.

Not so the P.1121, which came so near to flying that its cancellation is still regarded as one of the major mistakes in British post-war aviation. It began life in 1954 as the P.1103, a large two-seat missile-armed interceptor designed to meet Operational Requirement 329. Work on a prototype was started, but in 1956 the Air Ministry changed its mind and decided that what the R.A.F. really needed was a single-

P.1121



S THAT WEREN'T

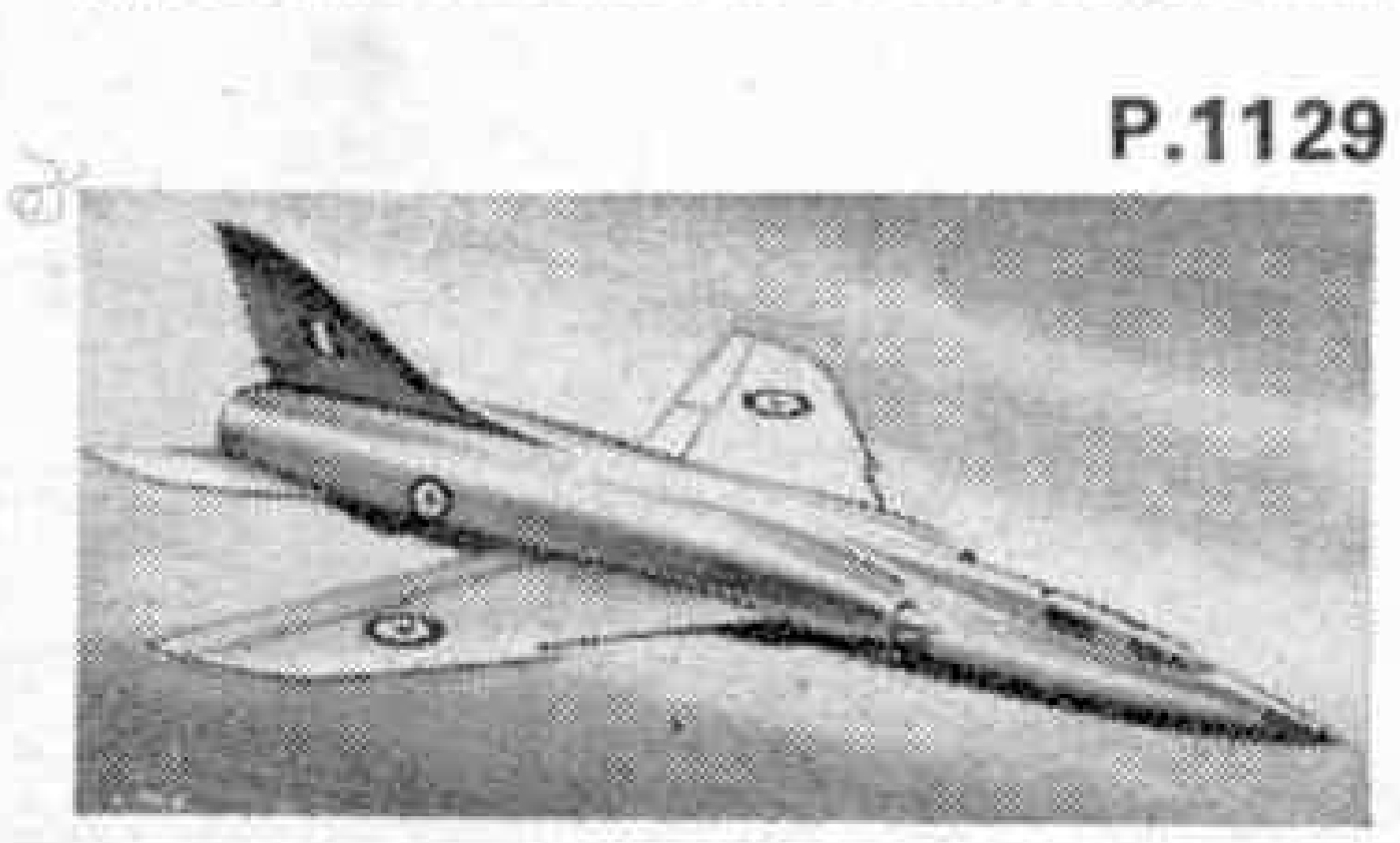


P.1154

seat fighter suitable for both interception and strike duties. Operational Requirement 339 was issued to cover the new ideas and although work on the P.1103 was stopped, Hawkers were encouraged to develop the basic design, at their own expense, to see if they could satisfy the new demands.

They did this by redesigning the aircraft to utilise any one of the three most powerful turbojets then available in Europe—the Bristol Olympus, Rolls-Royce Conway and de Havilland Gyron. Work began on a new prototype, known as the P.1121, powered by a Gyron P.S.26-6, giving 23,800 lb. of thrust with reheat. Even today, this aircraft looks advanced. Except for the underfuselage air intake, it was very like the Republic F-105 Thunderchief in appearance, but promised even higher performance, with a top speed of Mach 2·35 (1,550 m.p.h.) at 36,000 ft. Armament would have been fifty 2 in. rockets in two retractable packs in the fuselage, plus two Firestreak air-to-air missiles or a ton of ground attack weapons.

P.1129



Unfortunately, by this time the official requirement had been changed again, to call for a two-seater with longer range than the P.1121 could offer. So, reluctantly, Hawkers decided that they could not afford to finance any longer an aeroplane that nobody seemed to want and the P.1121 was abandoned in December 1958.

Construction of the prototype was so well advanced that, soon afterwards, a Middle Eastern government offered a vast sum of money if Hawkers would complete it, together with a second prototype. With such aircraft, they knew that they could fly over the territory of their neighbour without any possibility of getting shot down; but, of course, it was politically out of the question to accept such an order, however profitable!

Details of the P.1121 have been published before and the P.1127 vertical take-off fighter of today is deservedly world-famous, as it has pioneered a completely new era of combat aircraft and will serve with the R.A.F. in a few years. But it is doubtful if many readers of *Meccano Magazine* will have heard of the P.1129. This was to be a two-seat supersonic strike aircraft, powered by two jet-engines mounted side-by-side in the rear fuselage and armed with a nuclear bomb which it would have carried semi-submerged under its fuselage.

Ken McDonough's drawing shows, for the first time, how this aircraft would have appeared in flight. When I last met Sir Sydney Camm, he described it as: 'the worst miss of all—an aircraft with a better performance than the Phantom and one that would have gone a long way towards meeting the TSR.2 requirements, much more cheaply'.

He added: 'This, to me, is a terribly sad reflection, but it is in the past—what are we to do now? Are we to be out of the forefront of progress for a generation? We are putting all we know into the P.1154 (a supersonic development of the P.1127), but it is a newish type of aircraft with a new engine, so we shall want all the luck that is possible.'

Sir Sydney and Hawkers had no luck at all, as the government cancelled the P.1154.

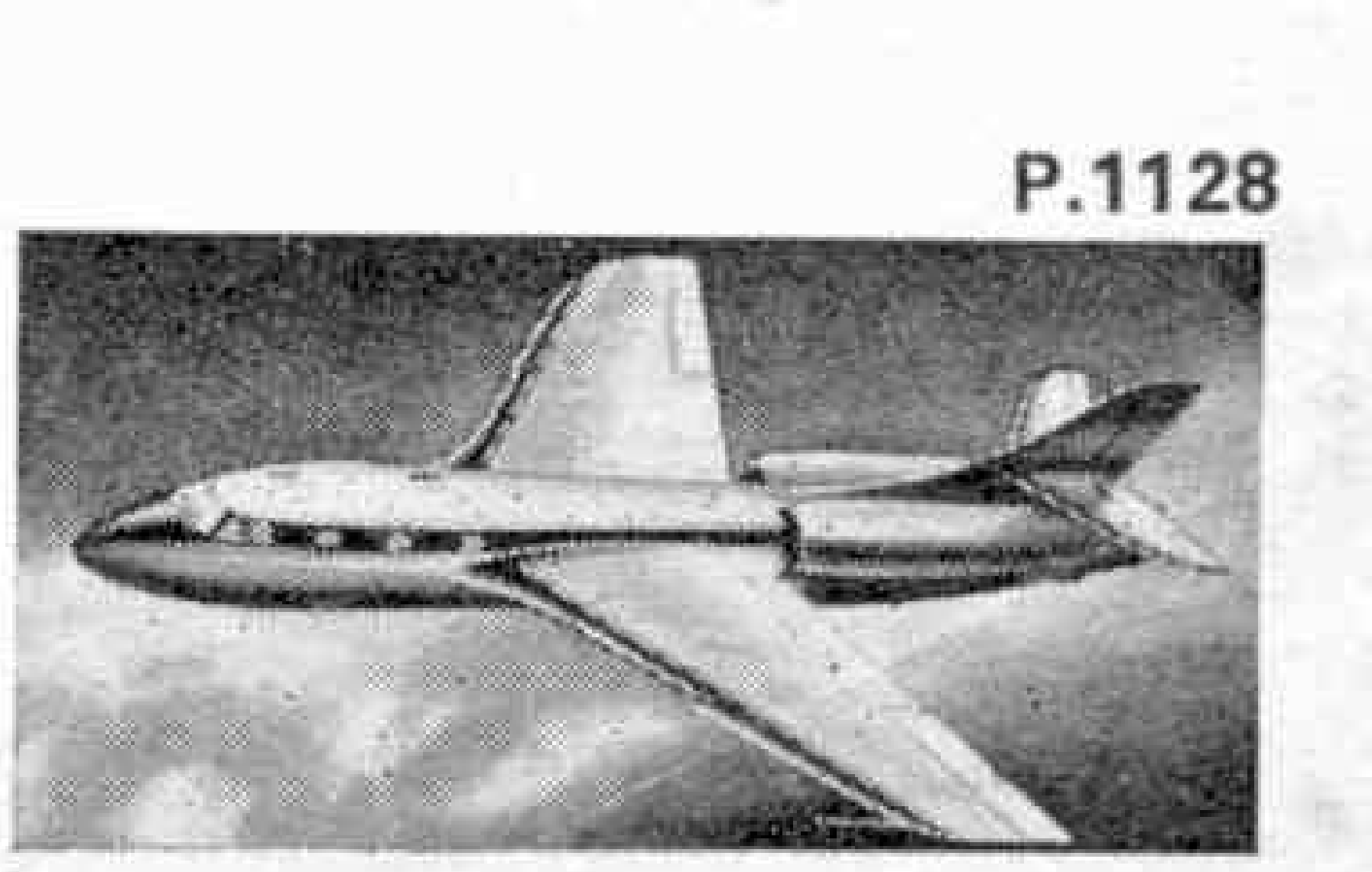
Looking through a collection of his last designs, one is overwhelmed by the breadth of his vision. Most spectacular, perhaps, was a fighter that had everything—a kind of Super Phantom with a 'swing-wing' and lift-jets for vertical take-off and landing. More modest was the P.1128, a little six-seat jet business aircraft based on the Hunter, with two Orpheus turbojets side-by-side in the rear fuselage instead of the usual Avon. Anyone with sufficient money could probably buy a second-hand Hunter and have it converted into a P.1128. The result would be one of the prettiest and fastest private aircraft in the world.

At a time when some aircraft are so ugly that they seem to have been born in a wind-tunnel rather than on a drawing board, the P.1128 reminds me again of almost the last words I heard from its designer: 'An aeroplane does not *have* to look wrong to be right.' Unfortunately, as this article has shown, it is no longer enough for aircraft to look right or even be right: unless government decisions are equally right, our aircraft industry will never again lead the world as it did in the great days of the Hart, Fury, Hurricane and Tempest.

John W. R. Taylor

Next month, John Taylor will write about a shape of the future—the Saab Viggen. This revolutionary aeroplane, which is just about to fly as we go to press, will also be the subject of a flying model, full-size plans for which will also be presented with the next issue. There's a picture of the model on page five

P.1128



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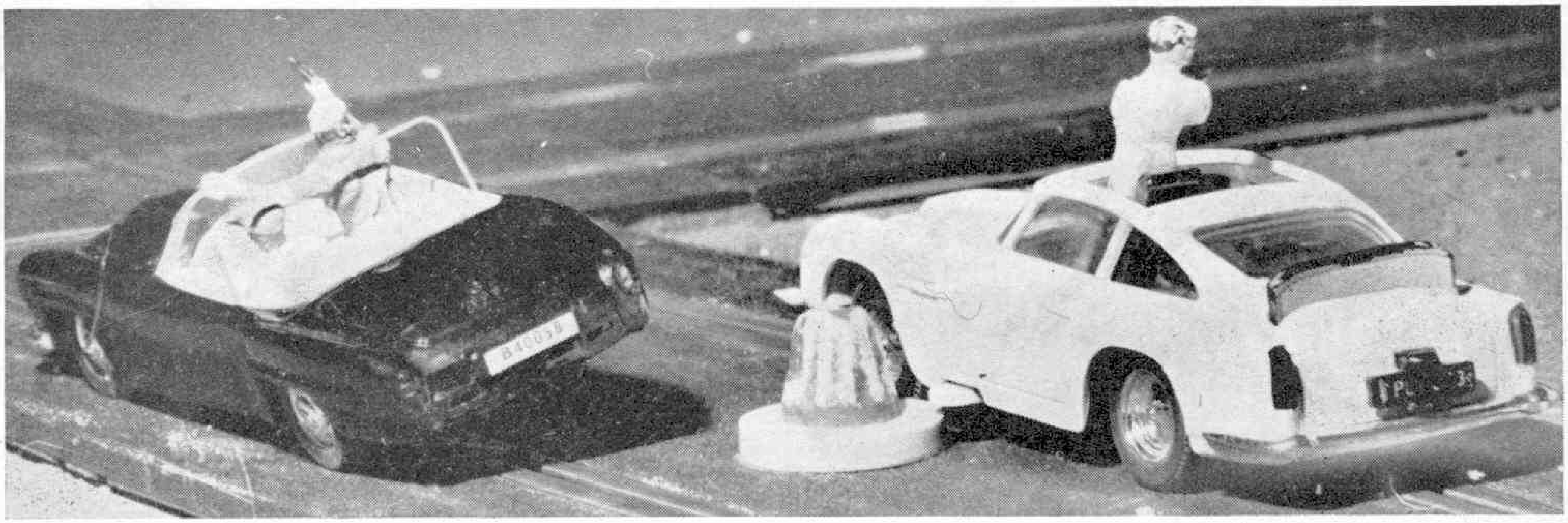
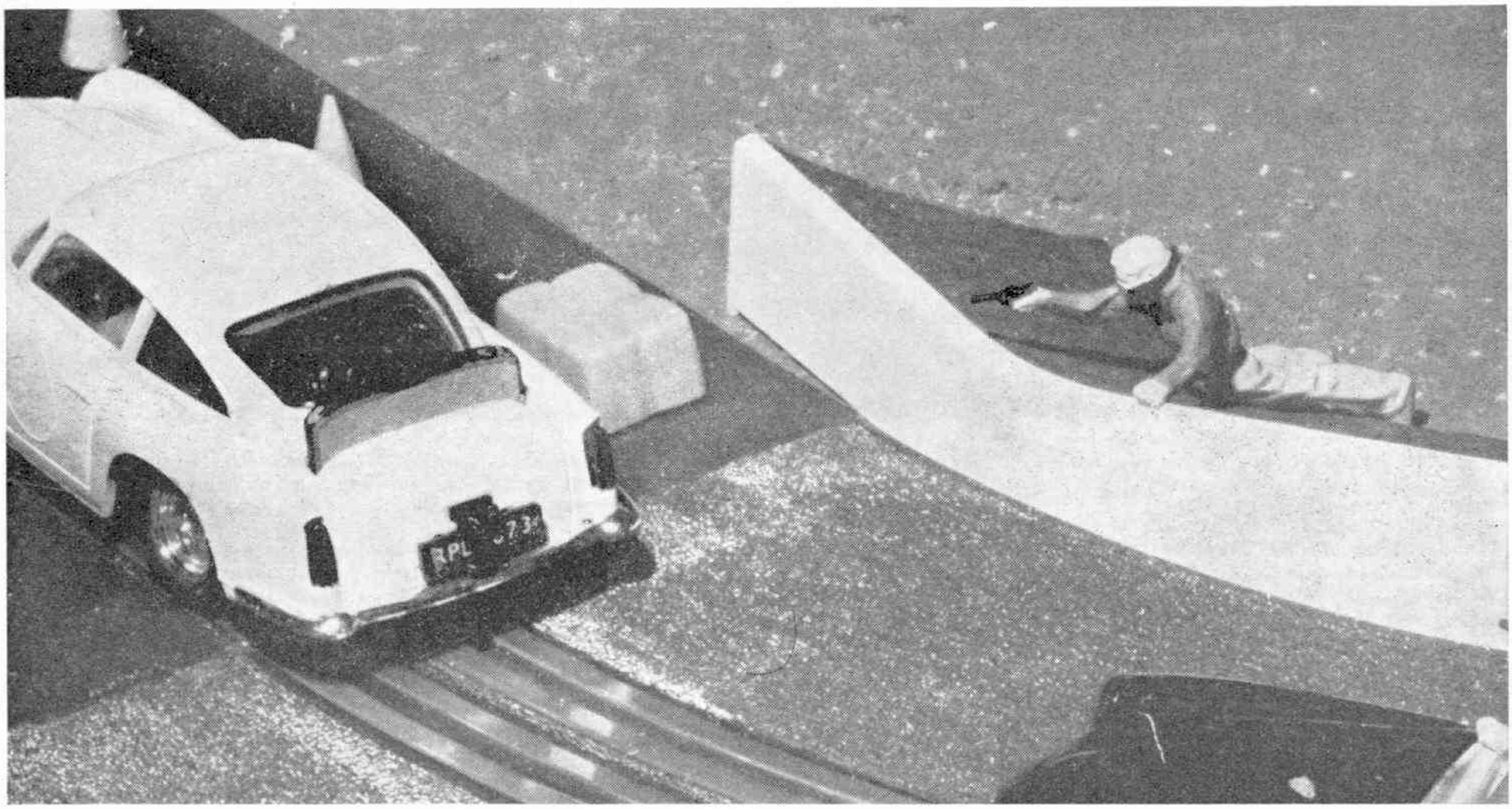




I MUST admit that I'm a catalogue addict. At this time of the year, when most firms are releasing their new 1967 catalogues, there is nothing I like better than a long session flicking through those colourful pages reading about new and exciting items soon to become available. Fellow catalogue enthusiasts, and racing enthusiasts in particular, will be delighted to hear that this year Scalextric have really done us proud in issuing not just one new catalogue, but two! The first deals with the well established Scalextric 1/32nd scale racing system, which has even more exciting additions for 1967, and the other catalogue heralds the entirely new 1/24th scale system, which we mentioned briefly last month.

The 1/32nd catalogue (eighth edition) is a really gorgeous, all colour publication giving fully illustrated details of the complete Scalextric range — 24 tightly packed pages, in fact, are needed to cover the vast variety of equipment and accessories that go to build an effective model racing circuit. But you know all about that! You all want to know what's *new*, so I'll tell you what's new—the best bit of Bondsmanship I've seen for a long time! It is fairly safe to say that James Bond is everybody's secret hero, and his popularity is showing no signs of dying whatsoever—in fact, I think that we shall continue to hear a lot about J.B. for just as long as 'M' has a stock of dangerous assignments on which to send him! During the course of his adventures, Bond invariably becomes involved in at least one hair-raising high-speed car chase, and Scalextric have produced an extremely ingenious racing set which reproduces practically all the thrills and hazards we read about in the Bond books or see at the cinema. Called the '007' Set, it will not become available until later on in the year, but I can assure you that it will be well worth waiting for! The track itself is basically a figure eight, incorporating a 90 degree crossing and two chicanes, one of which is extremely long. Two cars are provided, one for '007' himself, and one for the 'enemy'. Bond's car is, of course, his famous specially prepared Aston Martin G.T., and Scalextric have really gone to town with this model, as not only is it an accurate scale model of this famous vehicle, but it really does incorporate the exciting 'special features' so necessary for extracting J.B. from tight corners. The ejector seat for getting rid of unwanted passengers really works, as does the bullet proof shield for protecting the rear of the car from the gunfire of pursuing foes. Transport for the 'underworld' is provided by an extremely sinister looking shiny-black Mercedes

Benz 190SL Sports. The Merc carries a 'crew' of two, and a nastier looking pair of thugs I never wish to see, in 1/32nd scale or otherwise!

If, during the 'pursuit' around the circuit, the Mercedes touches the rear bumper of the Aston, the latter's bullet-proof screen springs up automatically. If, however, the Aston touches the rear bumper of the Mercedes, a special spring device beneath the Merc is released, which hurls it off the road in a mighty spectacular fashion! This 'bumper touching' can only happen on the long chicane, of course. Bond's enemy spy passenger is forcibly ejected through the sunshine roof when a large 'boulder' in the road has been passed a number of times—an extremely ingenious device this — and, above all, both drivers must try to avoid being forced off the road at the 90 degree crossing. In all, enough to give James himself a few grey hairs!

When the '007' Set becomes available, the various components will not be available separately, as the track and cars are really specialised, and would not be very suitable for ordinary racing. The standard range of Scalextric track can, however, be used to extend the '007' circuit.

Turning now to the 'Super 124' catalogue, I almost hesitate to torture 1/24th scale fans with advance news of this completely new system, but once again I can assure you that, if you like the 'big stuff' then this will be very well worth waiting for. The GP cars will be among the most finely detailed you have ever seen, with full engine and exhaust detail, authentic suspension, removable driver and even completely detailed cockpit with instrument panel! GT cars will incorporate some sensational new features, including mechanical front wheel braking and a high-torque motor developing as much as 45,000 r.p.m. Track, as mentioned last month, will be three-lane and weatherproof, giving ample scope for outdoor layouts. A 1/24th scale system is ideally suited to outdoor operation, and there is nothing quite so satisfying as racing in the garden on a summer's afternoon against a backdrop of natural scenery.

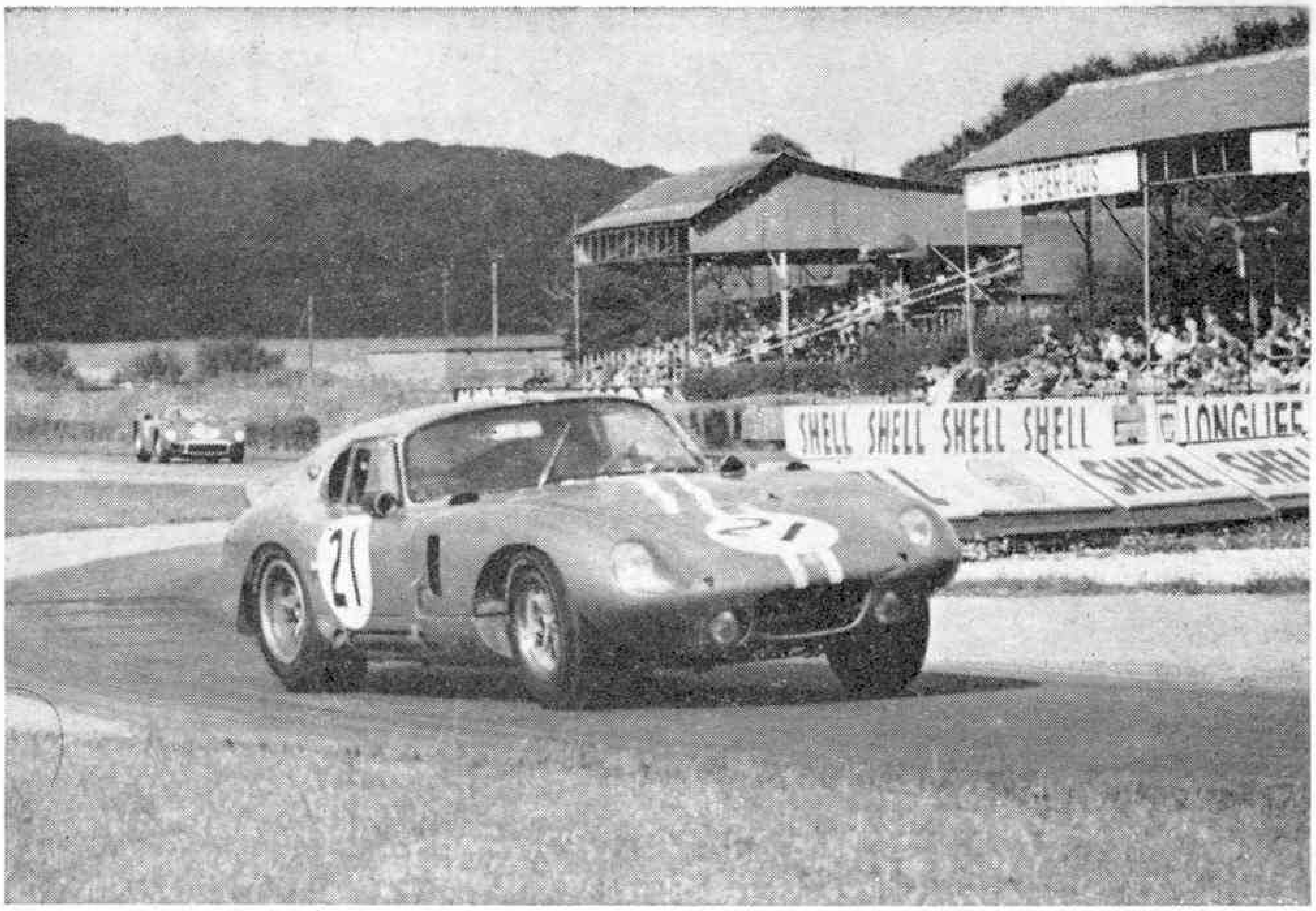
An easterly wind has just rattled the office window, and reminded me that both summer and Scalextric Super 124 are some way off yet. But there's no harm in looking forward to them both. I shall be writing at length on 1/24th scale when it becomes available!.

COBRAS IN ACTION!

Last month we described the new Scalextric Race-Tuned AC Cobra, so this month we thought you would be interested to see these Autocar pictures of real Cobras in action. You will notice that some racing Cobras have closed coachwork — 'conversion' addicts might like to try their hand at that one—and various schemes of stripes and racing numbers are apparent in the photographs. Crossed black tapes over the headlamps are commonly seen on GT cars during a race, but few model racing car fans bother with this refinement. Tiny strips cut from insulating tape would do the job. **—Pitman**

Opposite page, top: just out of the chicane, the Underworld's black Mercedes 190SL has had its bumper touched by Bond's car, and is in the process of hurtling off the track, out of control. As the Aston Martin passes the rock in the road, James Bond's unwelcome spy passenger is ejected unceremoniously through the sunshine roof!

Lower: this time, the pursuing Mercedes has just touched the Aston Martin's rear bumper, causing its protective bullet-proof shield to rise up from the recess just behind the back window. Someone at the road side is taking a pot-shot at the Aston

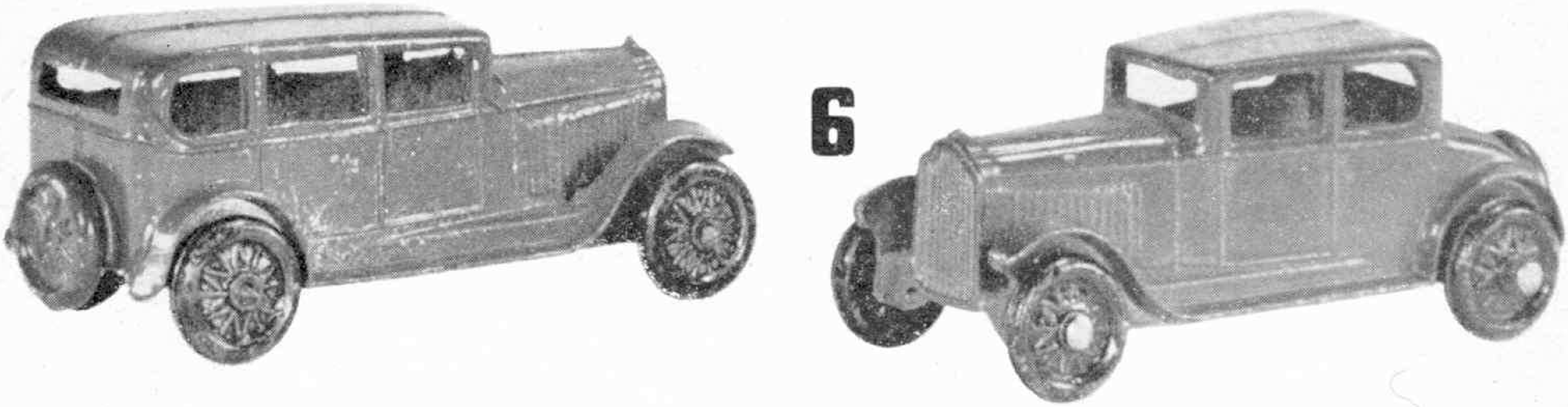


Top: this Cobra makes an exciting and atmospheric picture as it roars past the grandstand. The 'decoration' on this car consists simply of double white lines along bonnet, roof and back. Note that the number on the bonnet is not set straight, but diagonally

Above: an open Cobra leading the field. The treatment of decoration is slightly different here, as a broad white stripe is used on the bonnet instead of two thinner ones, and the number is straight

Here are the covers of the two exciting Scalextric catalogues, the 1/32nd scale catalogue on the left, and the new Super 124 above. The cover of the former looks like the familiar 'chequered flag', and there is no doubt at all that it's a winner!

SOME MORE



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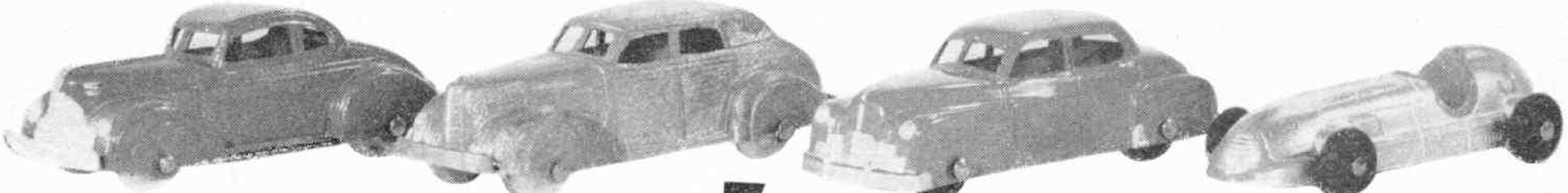

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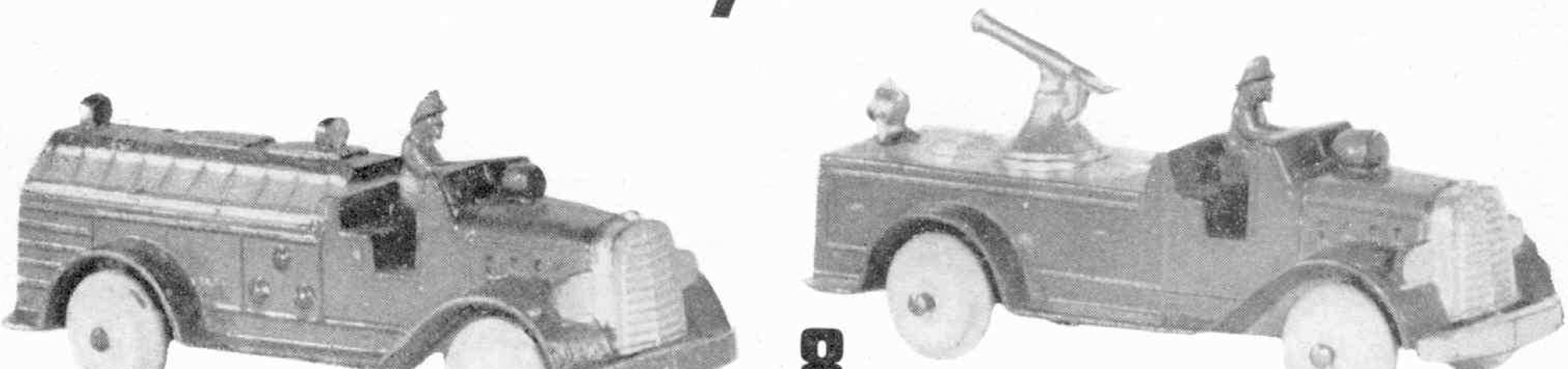

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Here is part 2 of Ken Wootton's Tootsietoy story. Everything from old

THE story continues with photo six which shows a pair of old timers—two Buicks, both mint, though they don't look it in the photograph (casting marks I think)—on the left, a Buick Six saloon enamelled in dark green, on the right a coupe which is in blue. Both these are one-piece castings with axle holes in the bodywork, all metal wheel/tyres and to a much smaller scale, smaller even than the Dinky 35 series such as the Austin 7 saloon, and fitting in reasonably well with the first type Mack truck featured last month.

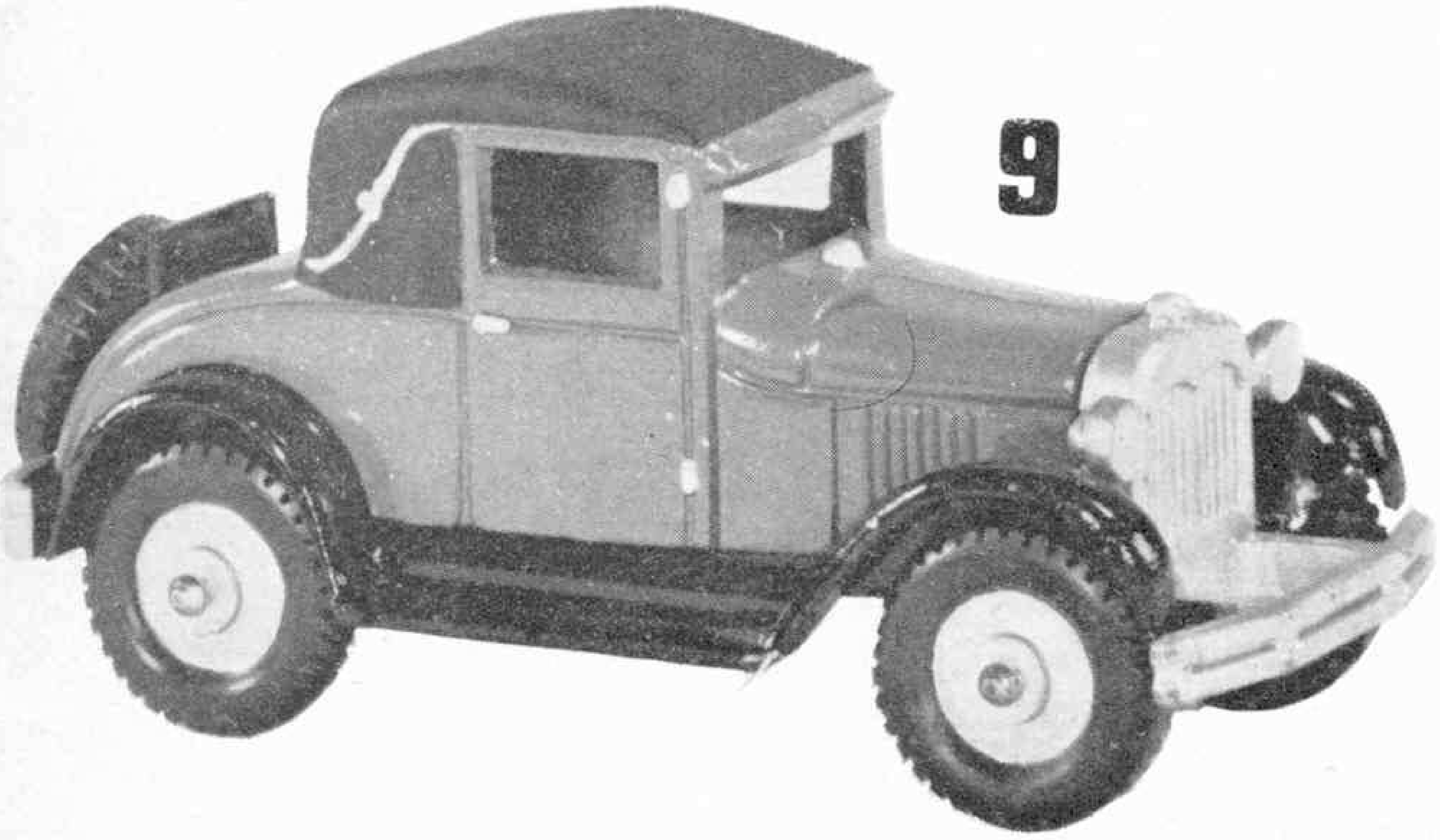
In photograph seven, I'm showing you four Tootsietoys, one pre-war, one almost wartime, and two post-war. From left to right, 'Lincoln Zephyr' coupe of 1940—mint, pillar box red. Unknown car — perhaps Ford — which was minus paint. This has now been rectified and it's now in 'Meccano Atlantean Bus' green. Number three (Mercury?) Sedan in mint red—exactly the same red as the Zephyr — and model four, an Indianapolis racer in silver with number and other details picked out in orange. All four are to a smaller scale than the Grahams, though larger than those vintage Buicks, and all of them have the Tootsie solid rubber wheels we're all familiar with. White before the war and black after. These tend to run up and down the axles with wear and I suggest those of you with this problem should use a section of an old ball pen refill which can be split and then popped around the axle between the wheels. I'd like to say here, that I don't collect *all* Tootsietoys, but only those which I personally find interesting—most people know my views on post-war Tootsies, but I *am* seeking certain pre-war ones, so if you've any spare, perhaps you'd care to drop me a line.

Back to the models and in the eighth illustration I again show two fire appliances. They're both red of course, one's mint and the other's a re-paint which isn't very good and needs 're-doing'. Certain details such as radiators, hose, etc., are picked out in silver. They have no base-plates, have the same solid wheels and are roughly the same size as the cars in picture seven. They're supposed to be Fords I believe.

Photograph nine has only been included for the benefit of those who haven't seen a Tootsietoys 'Classic' model. This is a Ford from their near-current 'Classic' series. It's quite a good car and by far the best of the bunch, the others being far worse than anything the Continent produces. The Model A will fit in very well with your 'Yesteryear' and R.A.M.I. models and is finished in mid brown for the body with black mudguards/baseplate. The matt black top is my own innovation, as are the silver wheel hubs, because these, with the tyres, are moulded in solid black plastic. If you haven't this one, write to your U.S. Pen Pals, it's worth having!

Ever heard of a British Tootsie? Well, the tenth

TOOTSIETOYS



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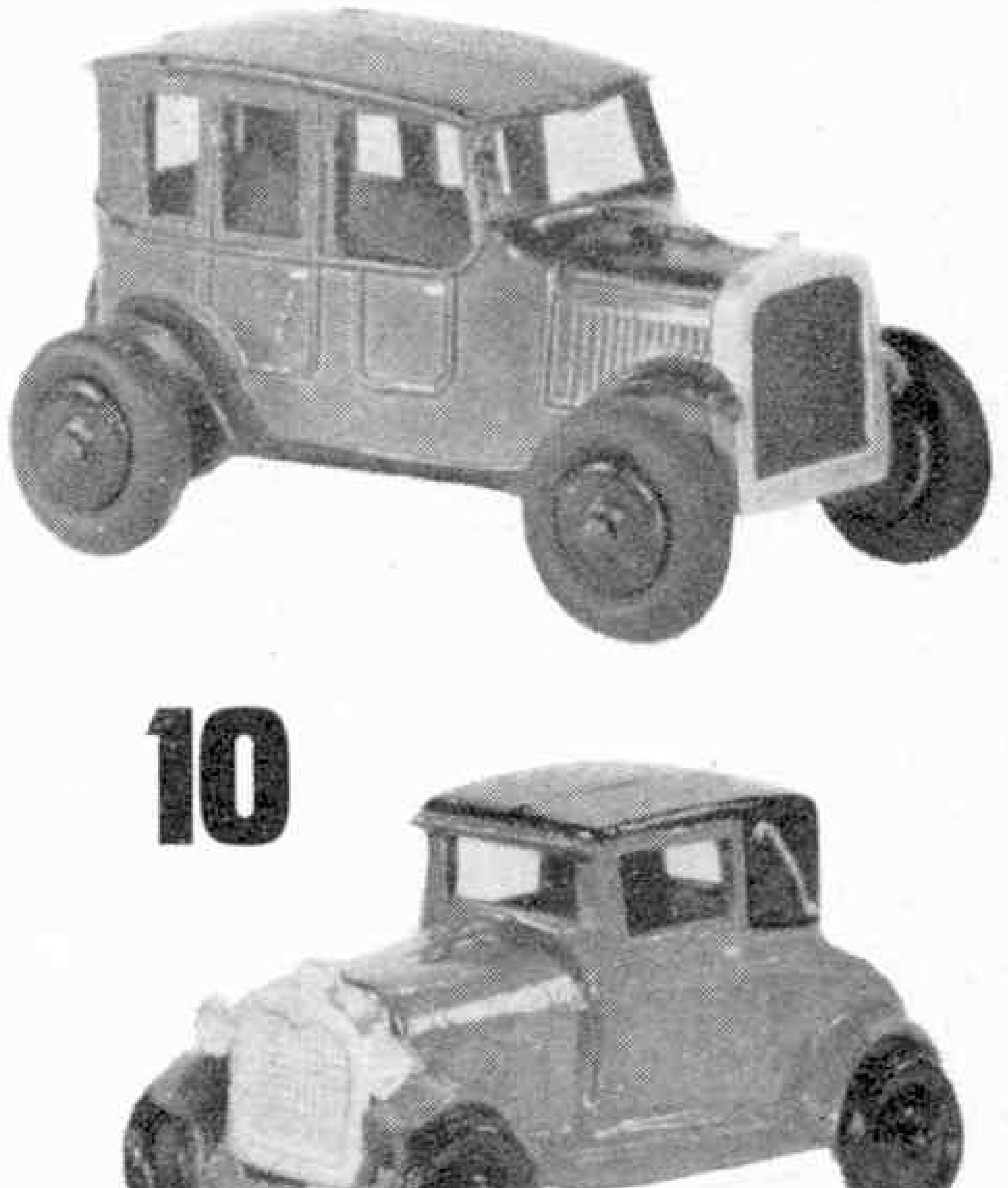

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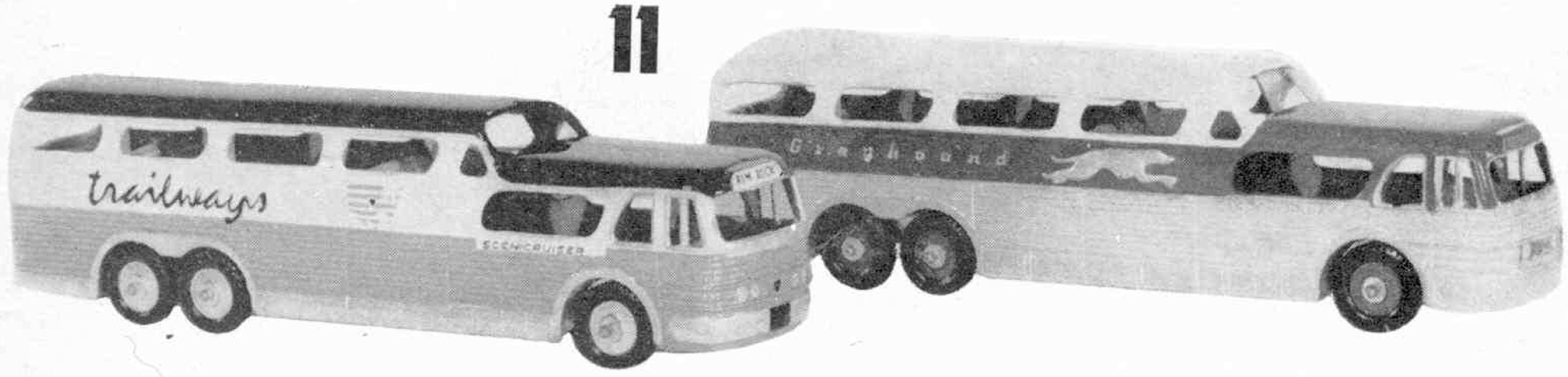


11

bangers to trans-continental coaches are to be found in this interesting range

picture shows two models which were *Made in England* by John Hill & Co., but are typical of the American range, in fact, I have both of them twice. The large model is Tootsie's famous yellow cab, the second Tootsietoy made. The wheels on the British version are of a later type (the Yankee having the solid wheel/tyre type which fit better) and make it look like some way-out hot rod! It's in a very fine metallic blue. The more conservative job underneath is in red with a black top and has had a coat of varnish added by me to preserve its lost lustre! Here, again, the American version seems better detailed. Quite probably, some of the moulds were loaned to the British company, who then ran off a few thousand castings, buffed away the word 'Tootsietoy' and Bob's your uncle. Anyone like to comment further?

If a deal comes off soon, I hope to be getting some more choice gems such as La Salle, T. Ford (the first Tootsie) more Macks, etc., and if all goes well, I'd like to tell you about these. So until this bright day dawns, I'll leave you with a couple of contemporary Tootsietoys, and in the eleventh and last illustration, are two Scenicruisers of the late '50s (for all bus lovers).

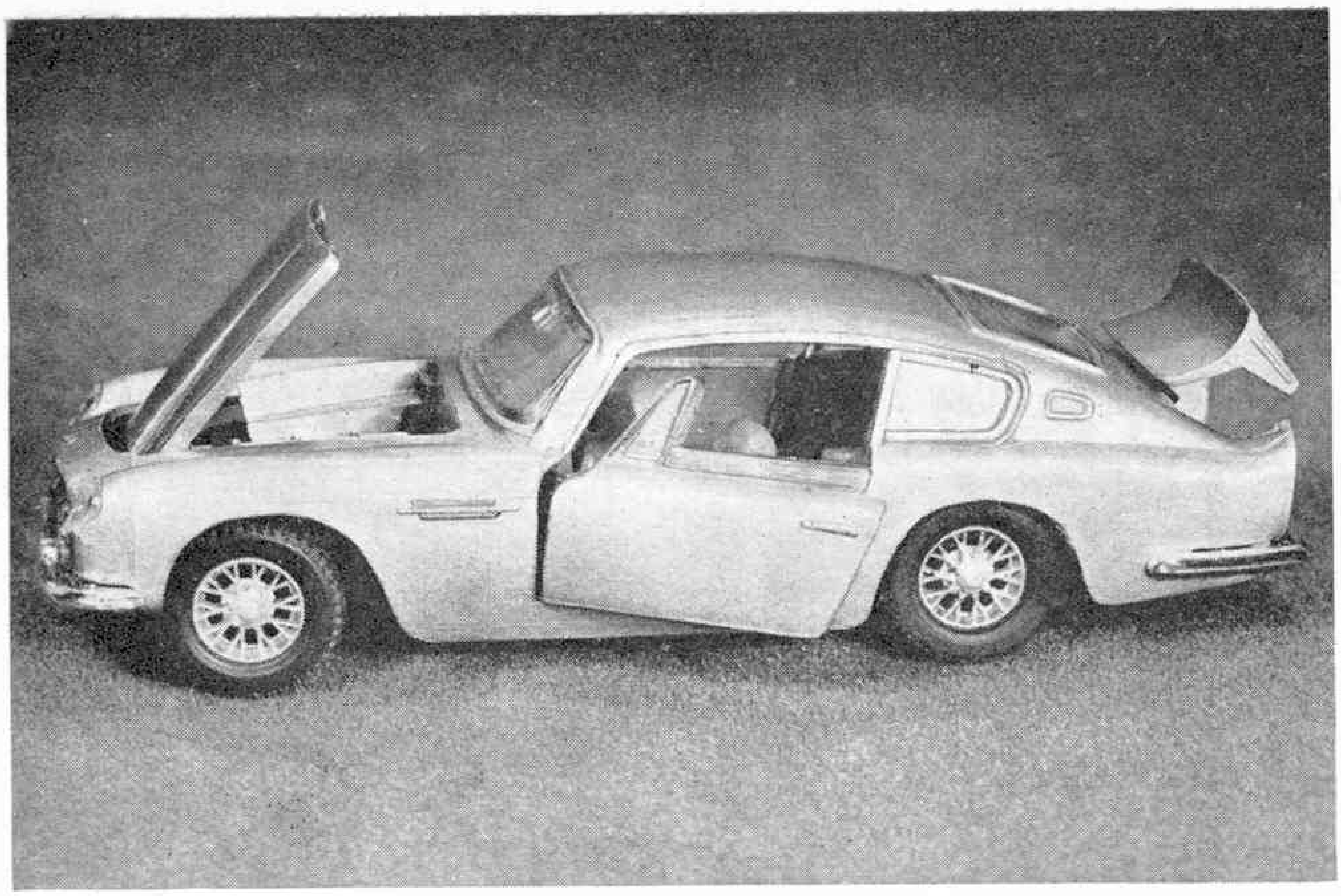
The 'Trailways' type is my own brain storm. Having removed the greyhound, etc., I slapped on some black, white and metallic red plus maps of U.S.A. on sides and rear and the words 'Trailways', which took ages to do. It all looked quite reasonable until I saw the photographs which magnify my shaky brush strokes!

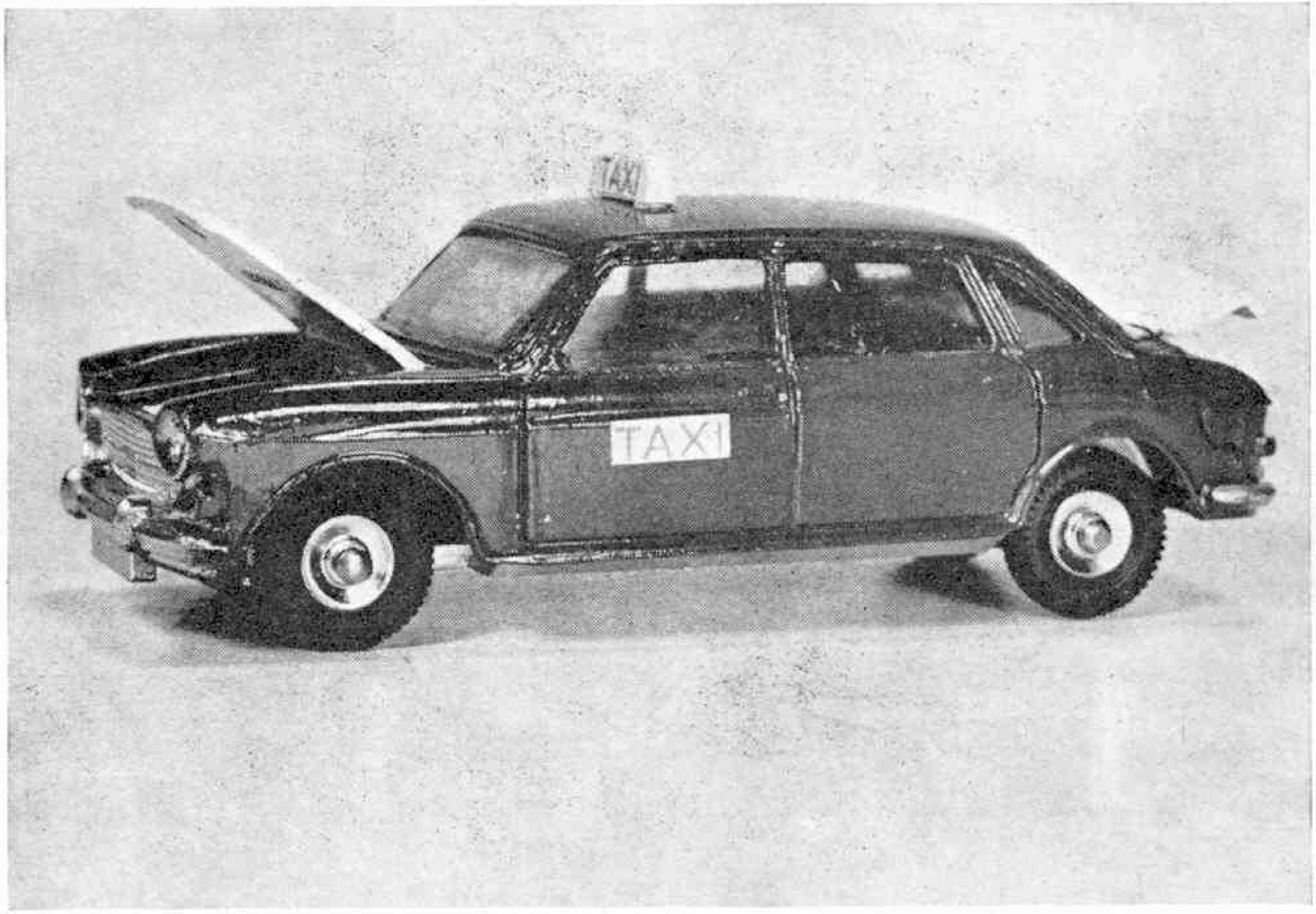
These coaches are cast in two pieces and are joined right down the centre. The mouldings (which are only reasonable) were badly put together and contained so much flash, etc., that the only thing to do was strip off all paint, remove all flash, then fill in the cracks with plastic metal and repaint. This I've done, and in the case of the 'Greyhound' the colours are white top, blue/silver. Incidentally, the body colour scheme isn't quite authentic, yours truly being in a hurry to see it finished, relying on memory, and not waiting for the necessary gen, which eventually arrived. The wheel/tyres, like the Model A, are moulded in one piece which I think is improved by painting the wheel section. To sum up, the coaches are seven inches long and so won't really fit in with the Dinky coaches, etc. As regards scale, they're poor models in comparison to those pre-war Tootsies. Nevertheless, it is interesting to see and have them in a collection, especially as I don't recall any other manufacturer producing a Scenicruiser (Lesney's is *much* smaller).

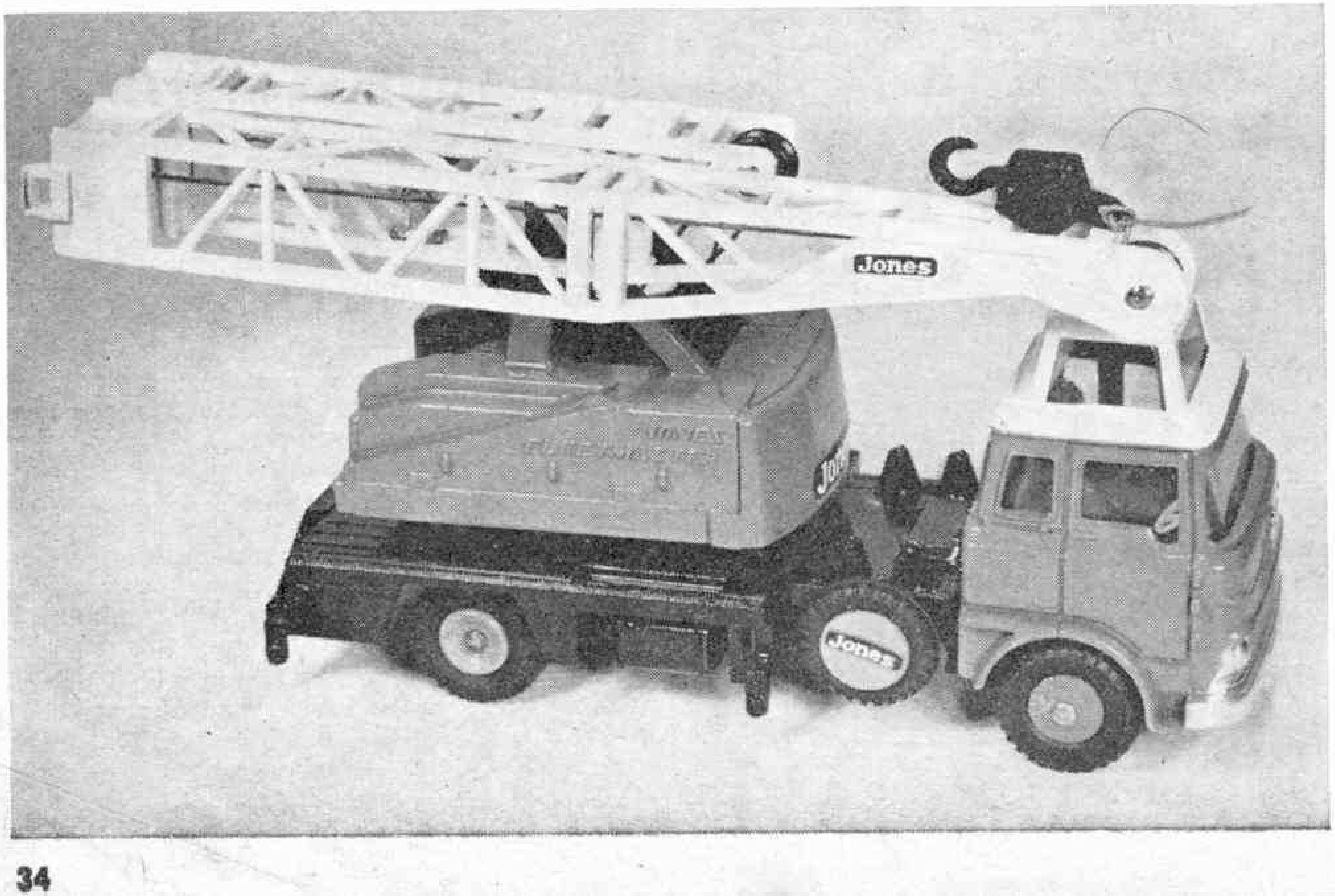
As I've said before, if and when more Tootsietoys come my way and with, I hope, much head nodding from the Editor, I'll again have a go and impart 'More Tootsie Info'! See you next month.

A DIVERSE TRIO

By Chris Jelley







'DIVERSE' is certainly the word to describe the three most recent Dinkys to be released at the time of writing this article—'Diverse' and, without a doubt, 'Excellent Models'. Neither of these descriptions, I feel, is an exaggeration. Take the former, for instance, and look at the models in question. These are No. 153 Aston Martin DB6, No. 970 Jones Fleetmaster Cantilever Crane and No. 282 Austin 1800 Taxi—a sports car, and a taxi. What could be more diverse than that? 'Excellent Models', on the other hand, needs far more individual justification, so the best thing I can do is cover them one at a time, beginning with the DB6.

Sports car

Before going any further, however, I should warn you that my description of this particular model may be coloured slightly by my own personal feelings rather than my professional duty. Off the record, I am deeply interested in sports cars, generally, and I think that the Aston Martin DB6 is the most superb example of this type of vehicle ever produced. It has long been my ambition (at present, unrealised) to own an Aston Martin or, at the very least, to drive one, so you can understand that a miniature version of the car starts with a distinct advantage. All the same, I think that the new Dinky will stand up to the critical inspection of any reviewer. Even before I took my model from its clear-plastic display box, I was strongly impressed by its almost perfect scaled-down body shape, its minute yet sharp casting detail and, most of all, by its magnificent silver-blue, metallic colour finish.

Once out of its box, my first favourable impressions of the model were enormously strengthened by the quantity and quality of the action features it carries—opening bonnet covering a huge detailed 'engine', opening boot, two opening doors, tipping backs to the front seats and, of course, Prestomatic steering coupled with 4-wheel suspension. Other features include plated radiator-grille and bumpers, 'wire' wheels, number plates and glass headlamps, plus windows, seats and steering wheel. Also present is an adhesive paper 'instrument panel', very well detailed, correctly shaped and with a 'wood' finish to it.

To allow the doors to open, their windows are separate from the main window moulding and are 'open', leaving just the quarter lights in position, with the tops of the windows peeping above the doors. The doors, themselves, could provide the only subject for adverse criticism as they don't open very wide, but this one point does not alter the fact that, overall, the DB6 is a really splendid new Dinky Toy!

Having dealt with the Dinky Toy, it is customary for me to cover the real life car. Knowing my personal feeling for this, however, I would probably go on writing about it indefinitely if I once got really started, therefore I will content myself by saying that the full-size Aston Martin DB6 is *the* sports car in existence today. Power comes from a 6-cylinder in-line engine of 3,995 c.c. capacity developing 325 b.h.p. at 5,750 r.p.m. and is transmitted to the rear wheels via a 5-speed all-synchromesh gearbox, to give the car a top speed in excess of 150 m.p.h.

Cantilever crane

Moving on to the Jones Fleetmaster Cantilever Crane, this is a fully operational model based on a machine produced by K. & L. Steelfounders and Engineers Ltd., Letchworth, Herts. The jib of the model is hinged part way up for ease of travelling and is erected simply by swinging it into position where it is held by a spring catch. Once in place a single crank handle at the side of the crane body gives control both of jib movement and of hook travel thanks to an ingenious dual-purpose gear system.

To explain this, separate winding drums, each incorporating a gear, are provided for the jib and hook cords, the gears on the drums being out of line with each other. The operating handle, also incorporating a small gear, fits between the drums so that, with the handle pushed in, its gear engages with the hook drum gear. Pulling the handle outwards, however, causes the gear to disengage with the hook drum gear and to engage with the jib drum gear. A strong spring acts on the shaft of each drum to prevent its cord from unwinding accidentally.

I imagine that a few sceptical collectors will take one look at the model and accuse Meccano of simply modelling the Jones Crane and then sticking it on a modified version of their own Bedford TK chassis. If so, they will be completely wrong as the model is an almost exact reproduction in every detail of the real Jones KL 3-7 Fleetmaster Cantilever Crane. K. & L. Steelfounders and Engineers Ltd., in fact, designed their own crane and chassis and simply used a modified Bedford cab.

There's no doubt about the cab being modified, as one glance at the accompanying picture will show—an extra level has been added! The 'turret' actually serves as the operating cab for the crane, the operator sitting on a fold-down seat, situated along with a set of control levers, above the driver and passenger seats. All these are represented in the cab of the Dinky Toy, although the operator's seat is in the folded-up position.

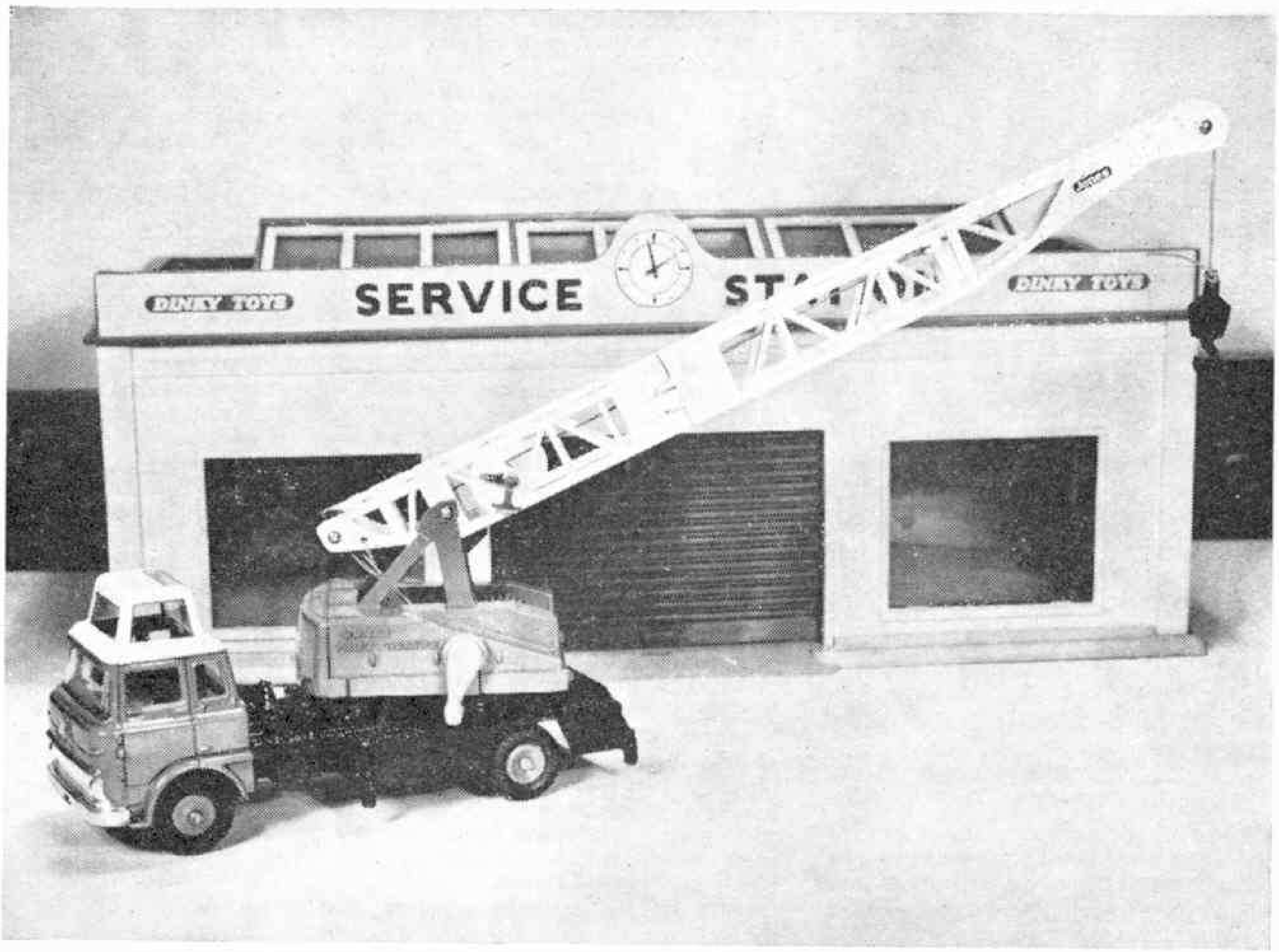
Approximate dimensions are rather impressive. With the jib dismantled and in the travelling position an overall length of 7 in. is obtained, but with the jib fully extended rearwards, the length amounts to nearly 13 in. Overall height with the jib dismantled is just under 3½ in. but, with the jib fully raised, is close on 10¼ in. Overall width is about 2⅝ in.

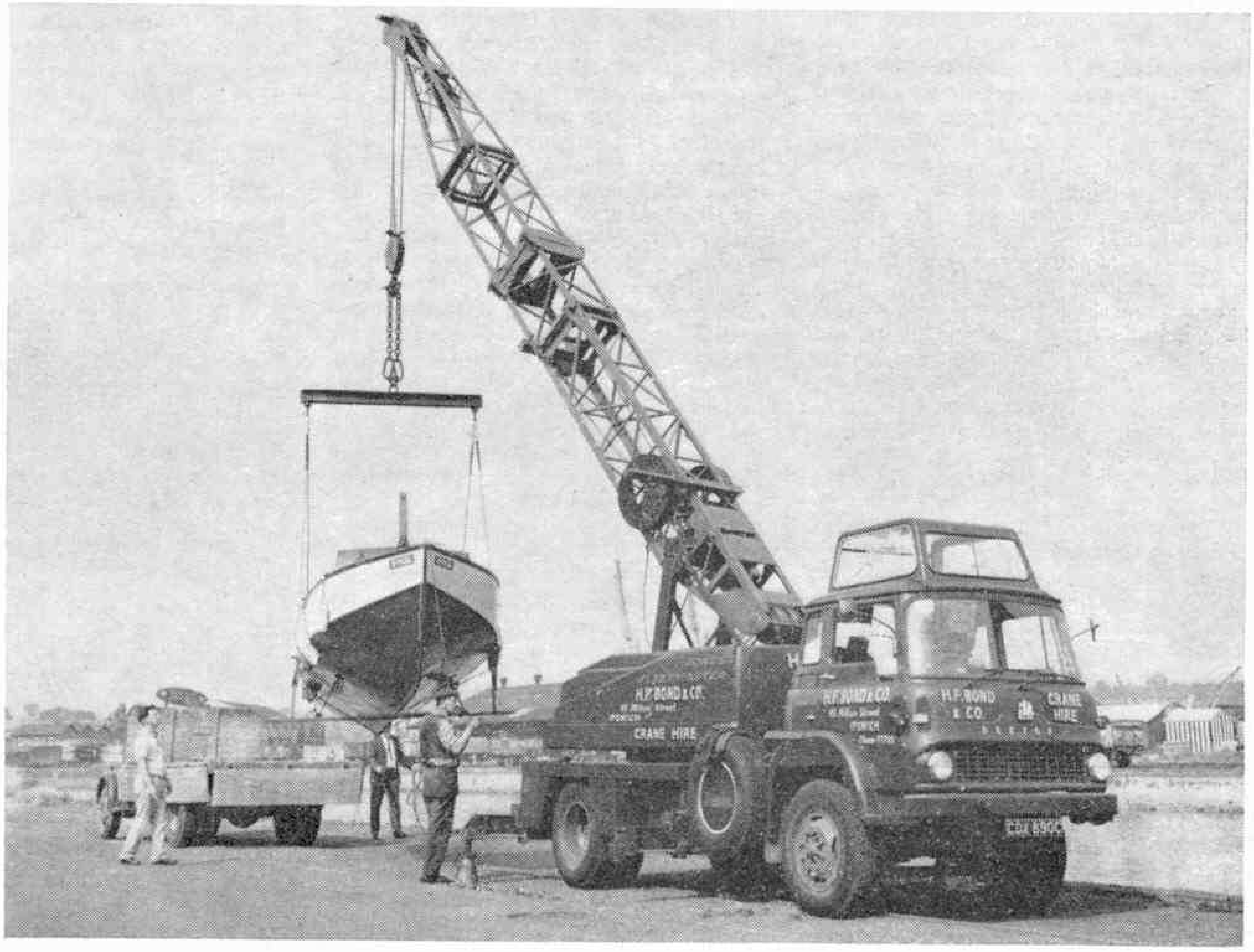
In the real vehicle, power for all operations, including road travel, is obtained from a Bedford diesel engine of 5,420 c.c. capacity. The standard jib length is 20 ft., but this can be increased to 30 ft. or 40 ft. by the addition of one or two 10 ft. intermediate sections. The Dinky Toy has a scaled-down 30 ft. jib which, in real life, will enable the crane to lift weights varying between 3,500 lb. and 17,920 lb., depending on the angle of the jib.

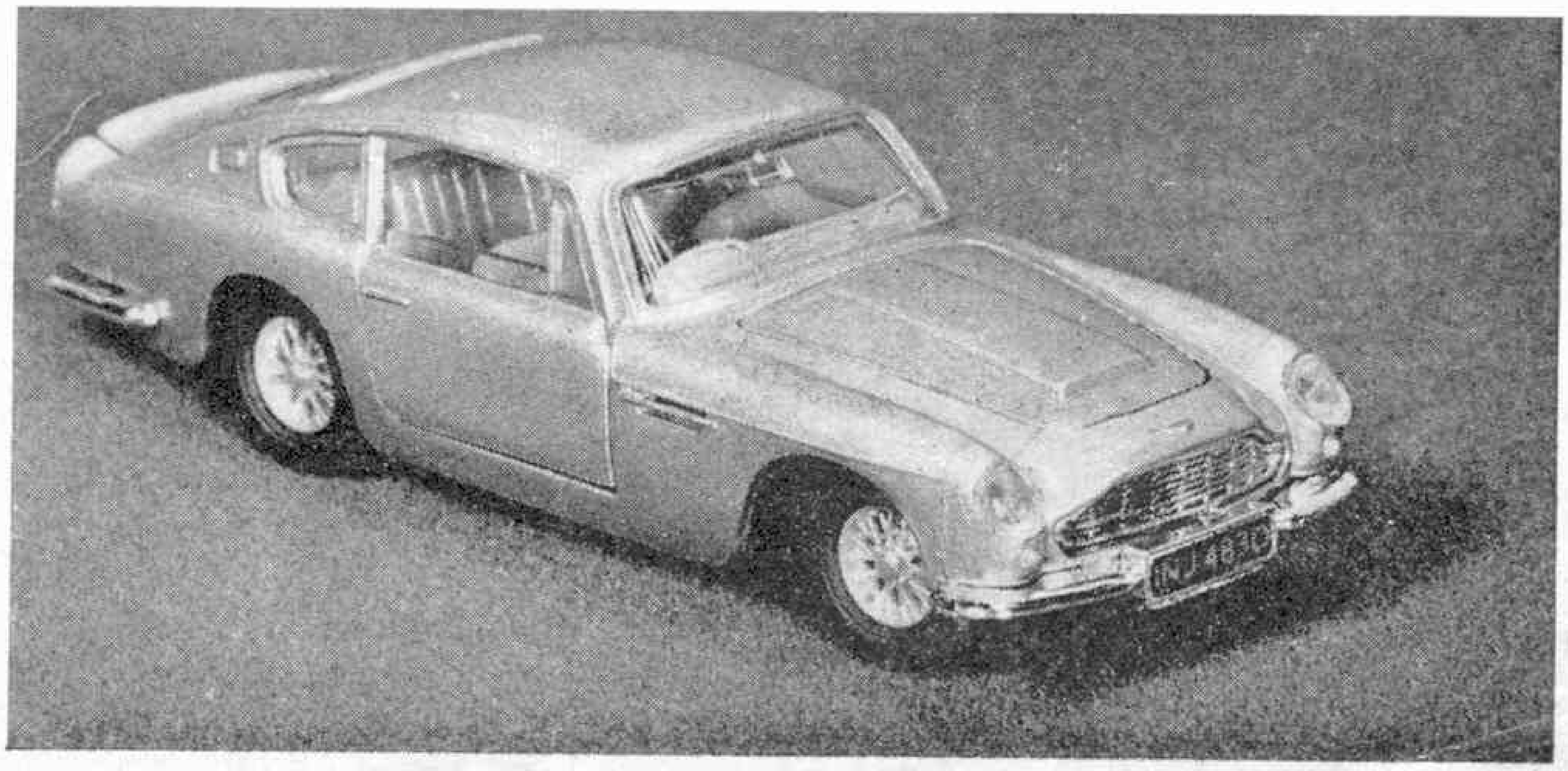
New taxi

There is a great deal more that could be said about the Fleetmaster Crane but I must pass on to the Dinky Austin 1800 Taxi while I have sufficient space left. This is actually a taxi version of the existing Dinky Austin 1800 equipped with a roof-mounted 'taxi' sign in white with red lettering and the word 'taxi' added to both front doors. Features include opening bonnet, opening boot, Prestomatic steering and 4-wheel suspension as well as a detailed engine, jewelled headlamps, windows and full interior fittings. The model is finished predominantly in a deep blue gloss, except for the bonnet and boot lid, which are painted a brilliant white that really catches the eye.

I must admit that, when I first saw this model, I was rather surprised as I had been expecting the normal 'professional' Austin Taxi. I soon realised though that the model was not meant to represent the standard hackney cab, but a typical 'private hire' taxi. These, as you know, are now extremely common sights in nearly every city and town throughout the country.





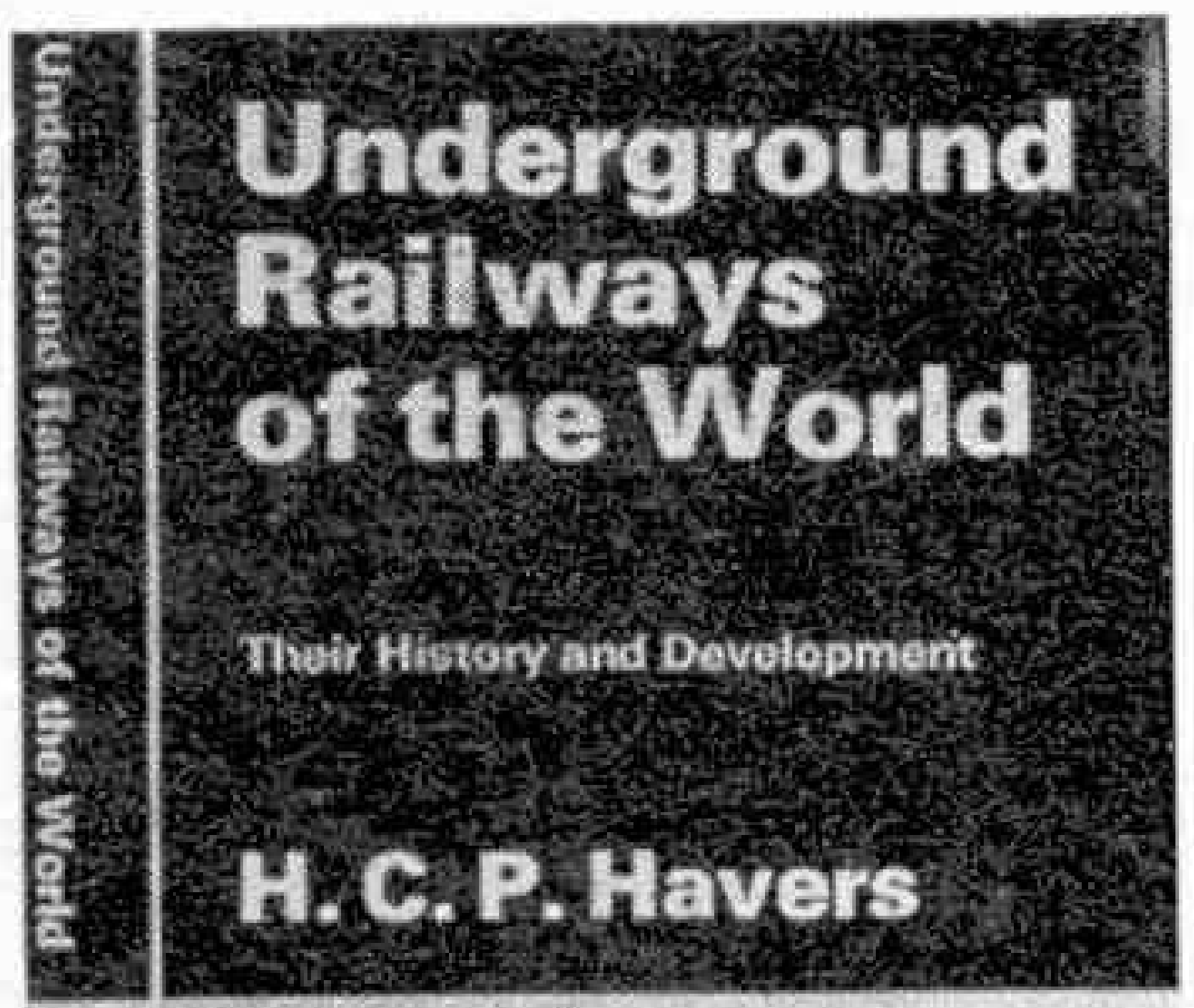


HAVE YOU SEEN

G.W.R. 'CASTLE' CLASS 4-6-0 LOCOMOTIVE BY G. AND R. WRENN LTD.

The 'Castle' class 4-6-0 express passenger locomotives of the erstwhile Great Western Railway were, without any doubt, one of the classic locomotive designs of this century. Designed in 1923 by C. B. Collett as a logical development of the Churchward 'Star' class, they inspired enthusiasts and railwaymen alike over a period of forty years. They became, in fact, such a well loved and integral part of the G.W.R. that their mass disappearance to the breakers' yards during recent years has seemed, to railway enthusiasts at least, nothing less than a tragedy—rather like demolishing Paddington station itself.

Like its famous prototype, the old Hornby Dublo 'Castle' was a much admired machine, and when it was discontinued some time ago, it left the proprietary scale model railway world not only without a 'Castle' but without a single G.W. main line engine! But rejoice, fans of the Great Wonderful Railway, for the 'Castle' is back with us again, in the shape of number 4075 'Cardiff Castle'. Now manufactured by G. and R. Wrenn of Basildon, Essex, it is a really impressive replica of the full size loco. The body of the engine is die-cast, which gives the model that satisfying heavy feel, and the distinctive tapered boiler and 'brass' edged splashers are reproduced to perfection. The boiler mountings also are just right, the chimney cap being 'copper' and the safety valve casing 'brass'. The handrails, though a trifle overscale, give the right effect, and are obviously much more robust than 'fine scale' ones would be. Below the footplate, the crosshead and slide-bars are of the characteristic 'Swindon' shape. The 'Castles' were four cylinder machines, but they had only two sets of valve gear, hidden between the frames and directly driving the valves of the inside pair of cylinders. The valves of the outside pair of cylinders were operated from the inside valve gear, via rockers just ahead of the cylinder cases. The rockers are not only there on the Wrenn model—they actually do rock! We feel that the inclusion of this feature is a considerable achievement, and it certainly adds a great deal of interest to the loco when running. Have we any criticisms? The rivet detail on the tender looks rather coarse and unconvincing, and we find it a little difficult to believe that flangeless centre wheels on the tender are *really* necessary. It is also a shame that the excellent and reliable motor projects so conspicuously into the cab—but all these are small points and we honestly believe that no Great Western enthusiast will be able to resist the addition of No. 4075 to his shed roster. From your model shop, price **£5 15s 6d.**


Underground Railways of the World
Underground Railways of the World
Their History and Development
H. C. P. Havers
H.C.P.Havers

WAGONS FOR 'N' GAUGE!

Ever since the introduction of 'N' gauge, British enthusiasts have been at something of a disadvantage due to the absence of 'British Outline' models built to this scale. However, this unsatisfactory state of affairs will not exist for much longer. Our picture shows two items of rolling stock from the Wrenn/Lima 'N' gauge range, and most enthusiasts will instantly recognise the B.R. prototypes that they represent. The goods brake van is the familiar British Railways standard 20 tonner, which was derived from a pre-Nationalisation L.N.E.R. design. As can be seen in the photo, the van body is really beautifully moulded, with every board of its 'planked' exterior fully represented. The guard's lookout or 'ducket' is there too, and the roof is complete with ventilators, rain strips and the stove chimney. A wide running board runs the full length of the vehicle for the benefit of shunters. All this in 2mm=1 ft. scale! Very nice indeed.

Coupled next to the brake van is another universally useful item, which can be seen all over the British railway system—the B.R. standard all-steel mineral wagon. These vehicles were built to replace the once very familiar wooden bodied wagons, and are most commonly seen with loads of coal. Once again, the tiny model succeeds in completely capturing the atmosphere of the prototype—look at the detail on that side door! Running gear is all there too; brake blocks, axle boxes, brake lever, channel section sole-bars, the lot! These vehicles will be available shortly, so watch out for them—they are well worth waiting for!

THE CALEDONIAN RAILWAY LIVERY REGISTER

Published by: The Historical Model Railway Society, 5, Cloister Mews, Englefield Road, Theale, Reading, Berks. **Price 7s 6d.** *17 p.p. 8 in. by 6½ in.*

In 1954 the Historical Model Railway Society decided to compile comprehensive livery registers of all the pregrouping railway companies. Referring to locomotives, rolling stock, road vehicles, ships and other equipment, the series will fill a long felt need among railway modellers and historians. The present register, No. 1 in the series, must have involved an immense amount of research, for every conceivable livery detail is included. This book covers the locomotives of the former Caledonian Railway which are dealt with in five periods, 1883 to 1891, 1891 to 1897, 1897 to 1906 and 1906 to 1923, with a separate section for goods and mineral locomotives. A valuable and extremely comprehensive work of reference which will be of interest to all modellers of the Caledonian Railway.

SIXTY YEARS OF THE BAKERLOO

By Charles E. Lee, M.Inst.T.
Published by: London Transport, 55, Broadway, Westminster, London S.W.1. **Price 2s 6d.** *24 p.p. plus 13 p.p. half-tone illustrations. 8½ in. by 5½ in.*

The popularity of cricket in the latter part of the last Century can be said to be the reason for the construction of the Bakerloo line, or Baker Street and Waterloo Railway, as it was then called. This original line ran for 3⅛ miles from Kennington Road (now Lambeth North) to Waterloo via Charing Cross, Trafalgar Square, Piccadilly Circus and Oxford Circus. Extensions added in 1907 to Marylebone, then called Great Central Station and Edgware Road, increased the popularity of the line, which carried 20½ million passengers a year. This has grown to 110 million passengers a year, and the line is now 32 miles long.

Work began on the line in 1898 and staging was built in the Thames near Hungerford Bridge to support several workshops and a Generating Station. Disaster occurred in 1900 on the failure of the London and Globe Finance Corporation which had invested £700,000 in the scheme. The line was saved by Charles Tyson Yerkes, of Chicago, who bought the London and Globe interests and who also took over powers for building other Tube Railways, bringing the underground railways of London under a common ownership. To mark the Diamond Jubilee of the line, the history and full story is told in this booklet by Charles E. Lee, a railway historian, and one who knows the line intimately.

UNDERGROUND RAILWAYS OF THE WORLD

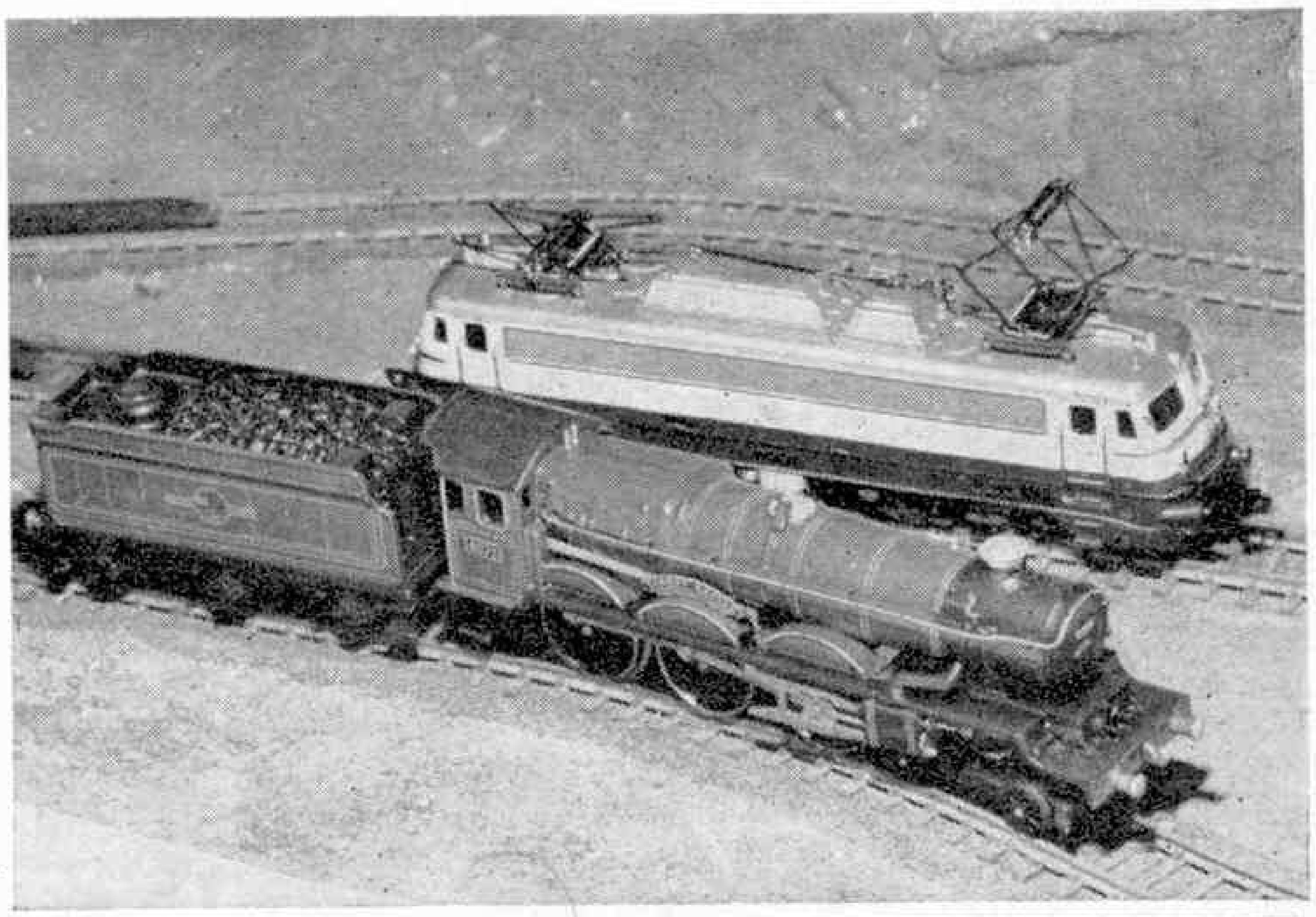
By H. C. P. Havers
Published by: George Newnes, Limited, Tower House, Southampton Street, London W.C.2. **Price 35s.** *197 p.p. plus 34 p.p. half-tone illustrations.*
8¾ in by 5¾ in.

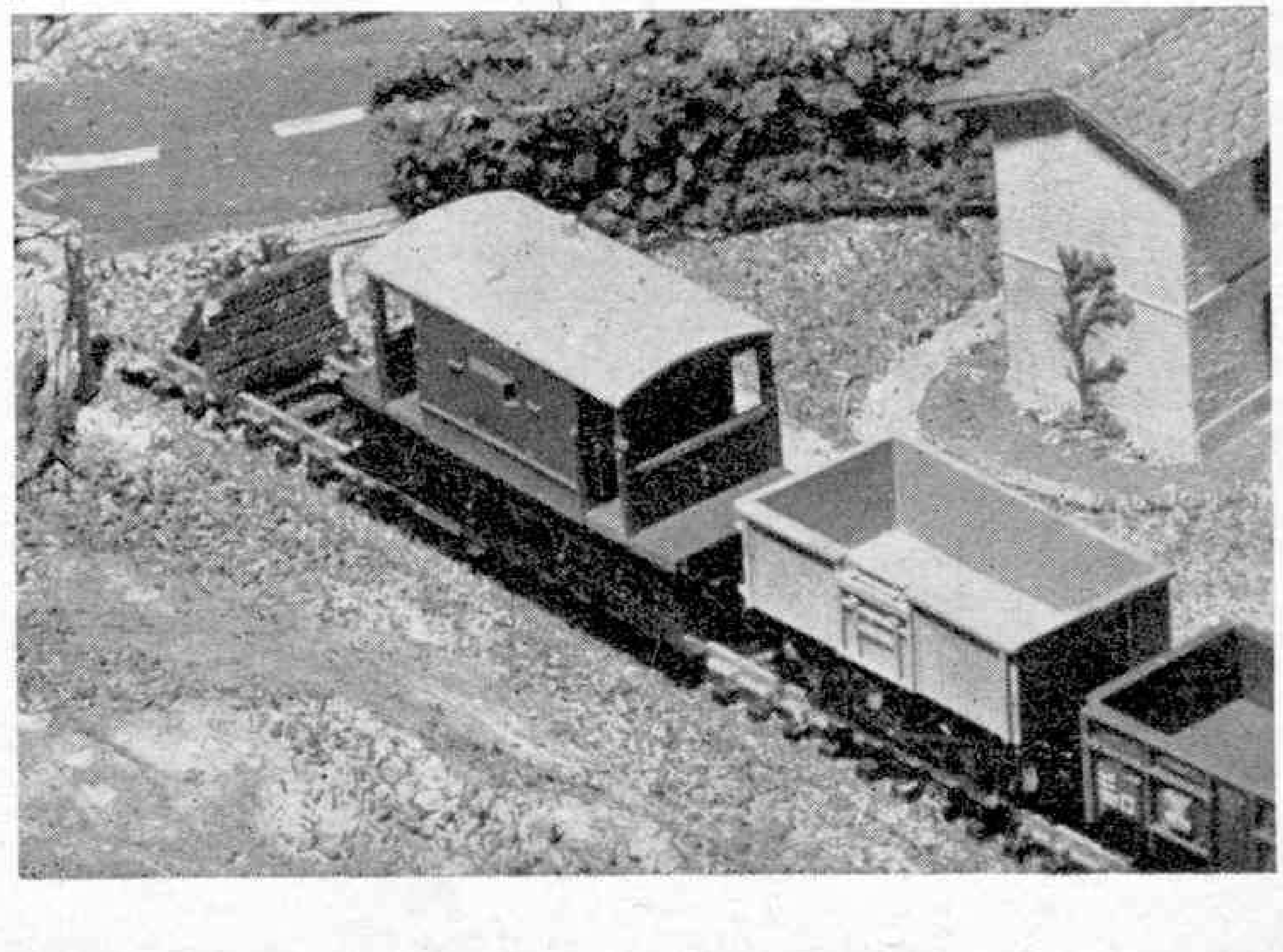
In these days of road congestion, especially in large cities, the problem of transport is becoming acute, and although many schemes are being tried, the most efficient form of public transport in large cities and densely populated suburban areas is undoubtedly the underground railway, which can carry large numbers of people cheaply and efficiently. It is not therefore surprising that 28 cities the world over have adopted some form of underground railway system.

The birth of the underground railway can be said to have taken place in this country when Marc Brunel made a second successful attempt in 1818 to drive a tunnel under the Thames, between Rotherhithe and Wapping. This became the first under river railway tunnel in 1869 when the London Brighton and South Coast Railway Company used it for their train services from their main line at New Cross. The engineer who completed the tunnel was Marc Brunel's son, the famous Isambard Kingdom Brunel. London was also the birthplace of the first tube railway, which opened in 1870 under the Thames from Tower Hill to Vine Street, a distance of only a quarter of a mile. From these early beginnings, much development work has been done on the constructional methods of both sub-surface and tube railways, in this and many other countries. The development of electric traction however, played a major part in making the underground railway a feasible proposition, and now the majority of systems use electrically propelled trains, the notable exception being Glasgow.

The book gives a description and historical account of each railway system, and also includes chapters on the growth of underground railways and developments in design and constructional methods. A well written, comprehensive book on the subject, it will be of value to all those interested in modern transport.

Below: contrast in motive power! The Wrenn 'Cardiff Castle' stands beside the Fleischmann German Railways Bo Bo locomotive which was described in 'Have You Seen?' last month. Lower: preview of two N' gauge wagons from the Wrenn/Lima range





MUCH MORE MINIC

By Pitman

A YOUNG friend of mine is an Armchair Slot Racing enthusiast. Have you ever met one? If you have, you'll know the sort of character I mean. He spends months, or even years, comfortably settled in a fireside chair, with the cat on his lap, dreaming of the super circuit that he is going to build—one day! Needless to say, nobody has ever seen any of his cars turn a wheel. In fact, nobody has ever seen any of his cars. I've often wondered why my 'armchair' friend has never been able to get started with a layout of his own—a real, solid working one I mean, not one that's 'all in the mind'—but when he dropped in to see me the other day, I found out a thing or two!

'Got a terrific idea for a new circuit,' he blurted, flushed with enthusiasm. 'Worked it all out last night.'

'Tell me more,' I said, cunningly steering him towards an armchair. He collapsed into it, and took a deep breath. 'It's an eight-lane job,' he explained, 'with a long, long straight down one side with the pits and paddock and all that, and a Le Mans start and a grandstand. Behind that there's a hill section through a pine forest—all fully scenic you understand—and a triple flyover, followed by sharp bends and chicanes, then another long straight with more gradients followed by . . .'

'How much space?' I ventured, casually.

'Space?' He looked visibly surprised. Nobody had ever asked such a question before! 'Well, I must admit that space is a consideration, when you come to think of it. It'll all have to go in the bedroom, of course, between the bed and the bookcase, under the window.'

'How much space?' I repeated, feeling rather cruel now!

He paced around a small imaginary square in the middle of the room. Eventually he spoke. 'About five feet by four,' he muttered glumly.

'And the long, long straights?' I enquired, 'and the flyovers?'

He sighed. 'I suppose,' he said, 'that I'm really trying to get a quart into a pint pot.'

'The answer to that problem,' I replied, 'is to put a pint into the pint pot instead. Have you seen the new Minic catalogue?'

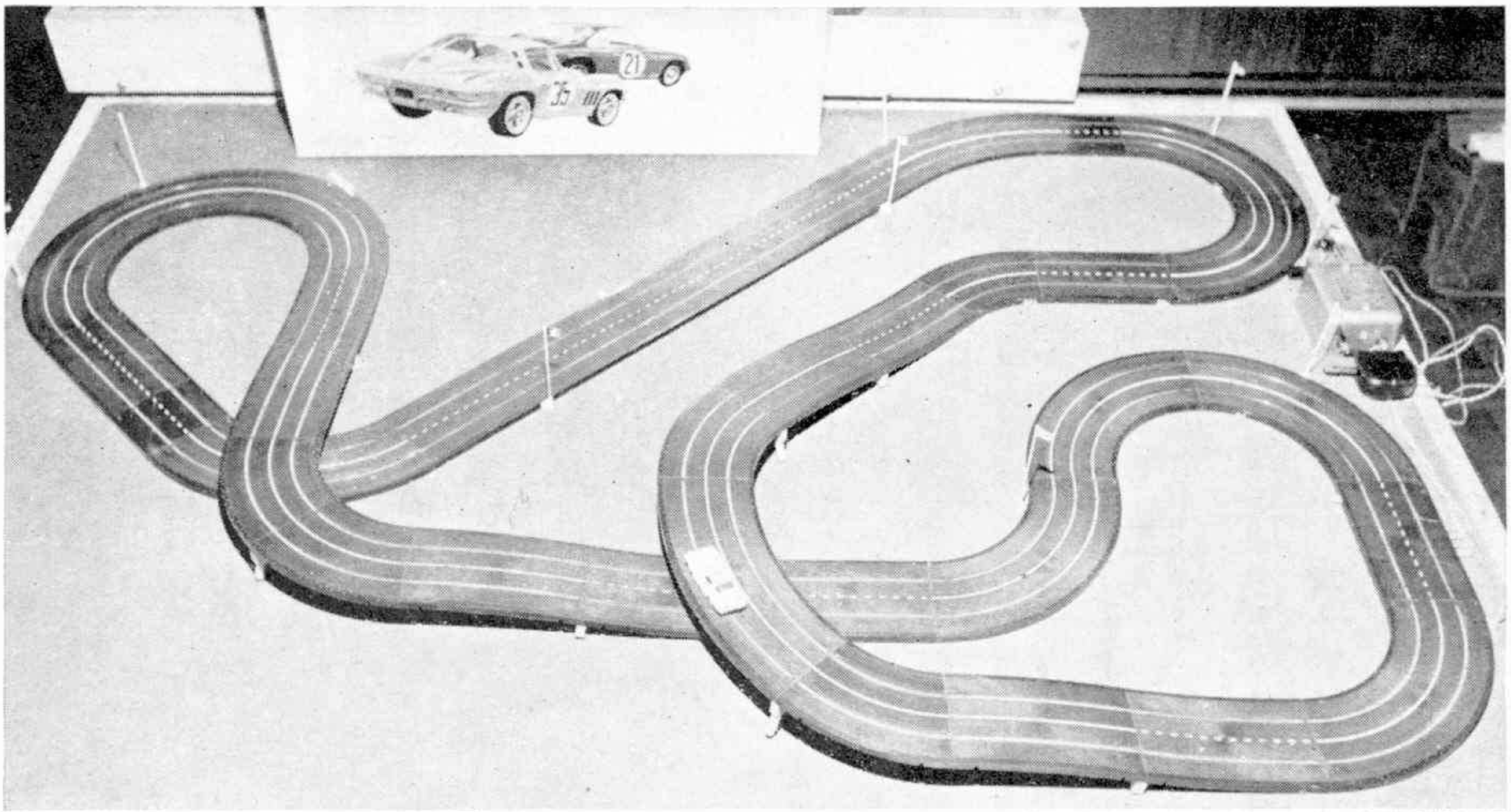
'Haven't seen one for years.'

'Then you've got a lot to learn about space saving.' I handed him the 1967 catalogue. 'Hot off the press. Mind your fingers, the ink's still wet.'

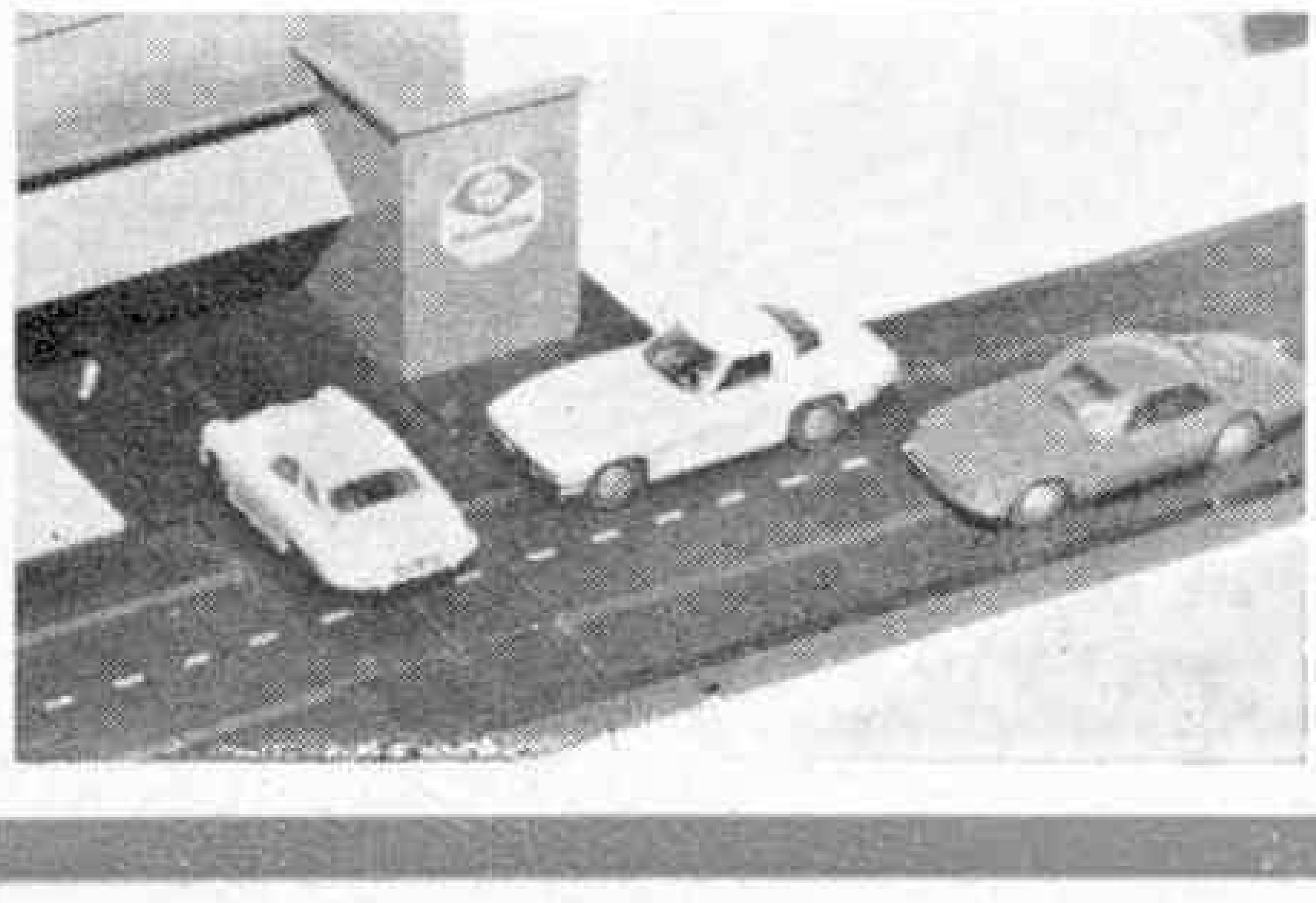
We discussed the contents of the catalogue at great length. Much of it, of course, although new to my friend, would be very familiar to confirmed Minic fans like you and me, but there are also a great number of very exciting additions to the Minic range that will become available during the course of 1967. The pictures on this page will probably whet your appetites! Most exciting of all, to me at least, is the Cobra circuit, with its fascinating track formation, two flyovers and long straight—and it all fits neatly in an area of only 5 ft. by 3 ft. 6 in.! There are new cars, too; a beautiful little replica of the Aston Martin DB6, complete even down to the very distinctive aerodynamic 'spoiler' at the rear, and a model of that playboys' dream, the Jaguar E type 2+2 Fastback. (Unfortunately we were not able to include a picture of this one this month.) All Minic cars are now supplied with a colourful sheet of authentic racing and rally stripes, numbers and markings. You can actually decorate your cars in your own personal scheme—that's individuality for you!

For enthusiasts who prefer rallying to racing, another Rally Hazard will be available later on in the year—and what a hazard! As the rally cars approach a roadside garage, a Mad Motorist backs right out into the road. In a split second, the rally drivers must decide whether to jam on the 'anchors' or take pot luck and dice through—terrifyingly true-to-life! More about this set when it becomes available.

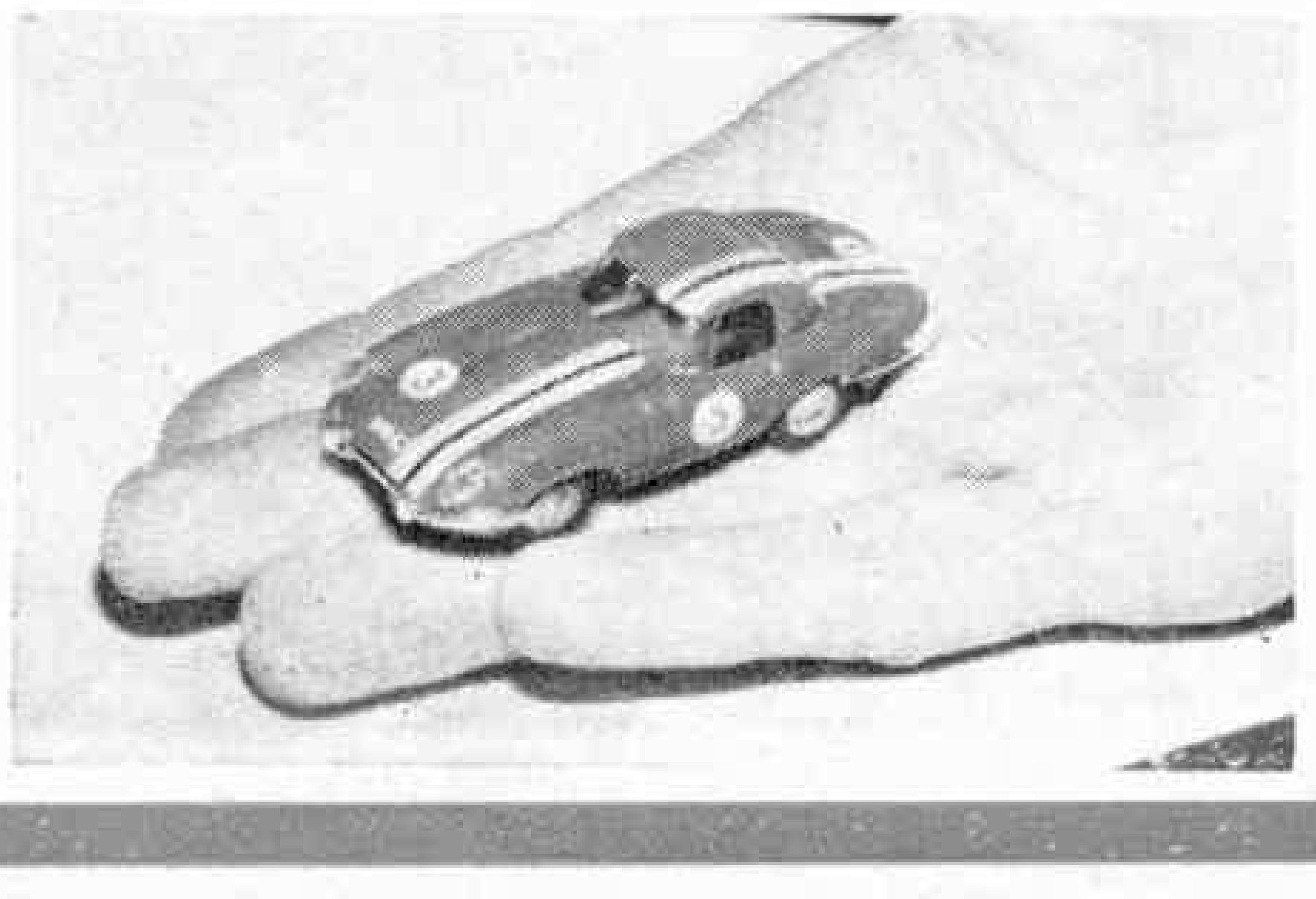
Well, that's about all I have room for this month. Perhaps I've converted some of you to the 'Table-Top Motoring' idea—there's nothing like it if you're short of space—and I have an idea that my 'Armchair Enthusiast' will soon have some cars running!



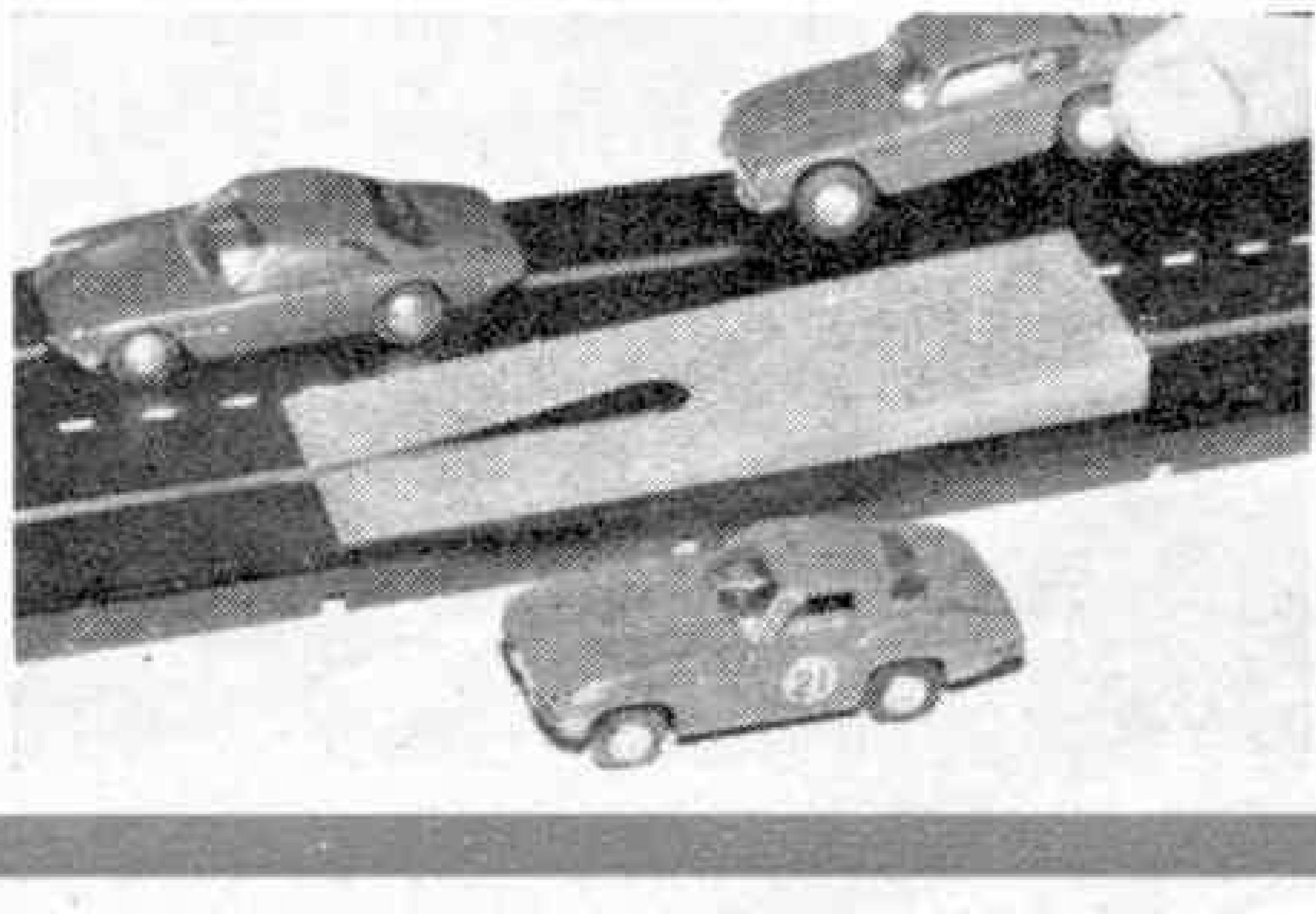
1. General view of the Cobra circuit. Wonderful scope for scenic effects here, and all in 5 ft. by 3 ft. 6 ins.



2 Coming attraction. The Madman in the Porsche has just backed out in front of the Stingray. Will the Ferrari get through? Wait until later this year for the next thrilling instalment!



3. This E type has been 'dressed up' with rally stripes, numbers and license plates, and very smart it looks, too



4. The Ferrari Superfast, Chevrolet Stingray and new Aston Martin DB6. The latter is about to be put on the track with the aid of the new Minic 'Track-Mate', which takes all the fumbling and cursing out of the job! Just clip the 'Track-Mate' onto the track, and slide the car down it—slot and guide align automatically

Build a vertical Steam

STEAM power, undoubtedly, has been one of the most important factors in the immense technological advancement of the world since the start of the Industrial Revolution two hundred years ago. It was steam that drove the machines of industry. There were steam locomotives on the railways. Steam engines drove the ships of the oceans, and steam even powered vehicles on the roads and tractors in the fields. In short, steam opened up a whole new horizon in a newly-industrialised Britain. History, however, is constantly advancing and, as the world progresses with it, the great inventions of the past are replaced by new and better things.

True to this fact of life, steam itself is fast becoming obsolete; superseded by other forms of power—the internal combustion engine, electricity, and now even the energy provided by the atom. As I said in a recent M.M., the great steam engines which once thrilled our parents are quickly disappearing and, in many cases, have already gone. It seems to me that, soon, the only way to remember these old machines will be to reproduce them in model form. In fact, I see no reason why we shouldn't begin right away and for this reason I feature here a Vertical Steam Engine typical of a type in common use earlier this century. Construction of the model, which is powered by an E15R Motor, is not difficult, as you will see.

Beginning with the base, a 12½ in. Angle Girder 1 is extended four holes by a 3 in. Strip 2, at the same time fixing a 2½ in. Angle Girder 3 and a 9½ in. by 2½ in. Strip Plate 4 in position. This Strip Plate is edged along the top by a 9½ in. Angle Girder 5, extended one hole by a 1½ in. Strip 6, and joined to Angle Girder 1 by a 2½ in. Strip 7. Strips 6 and 2 are connected by a 3 in. Strip 8.

Another side is now built up from a second 9½ in. by 2½ in. Strip Plate, bolted to a 12½ in. Angle Girder 9 and edged by a 9½ in. Angle Girder 10, a 2½ in. Angle Girder 11 and a 2½ in. Strip 12. Both sides are then joined at each end by two 5½ in. Angle Girders 13, the intervening space being enclosed by a 5½ in. by 2½ in. Flexible Plate 14. A 5½ in. by 5½ in. Compound Flat Plate 15 is then built up from a 5½ in. by 3½ in. and a 5½ in. by 2½ in. Flat Plate, and is bolted to Girders 5 and 10. At one end, a 3 in. Strip is attached to upper Angle Girder 13 by an Angle Bracket, then three 2½ in. by ½ in. Double Angle Strips 16 are bolted to this and to Strip 8 to provide steps. At the other end, two 5½ in. by 2½ in. Flanged Plates 17, joined by a 5½ in. Angle Girder, are bolted one to each Angle Girder 1 to provide a platform which will later be used for the Electric Motor.

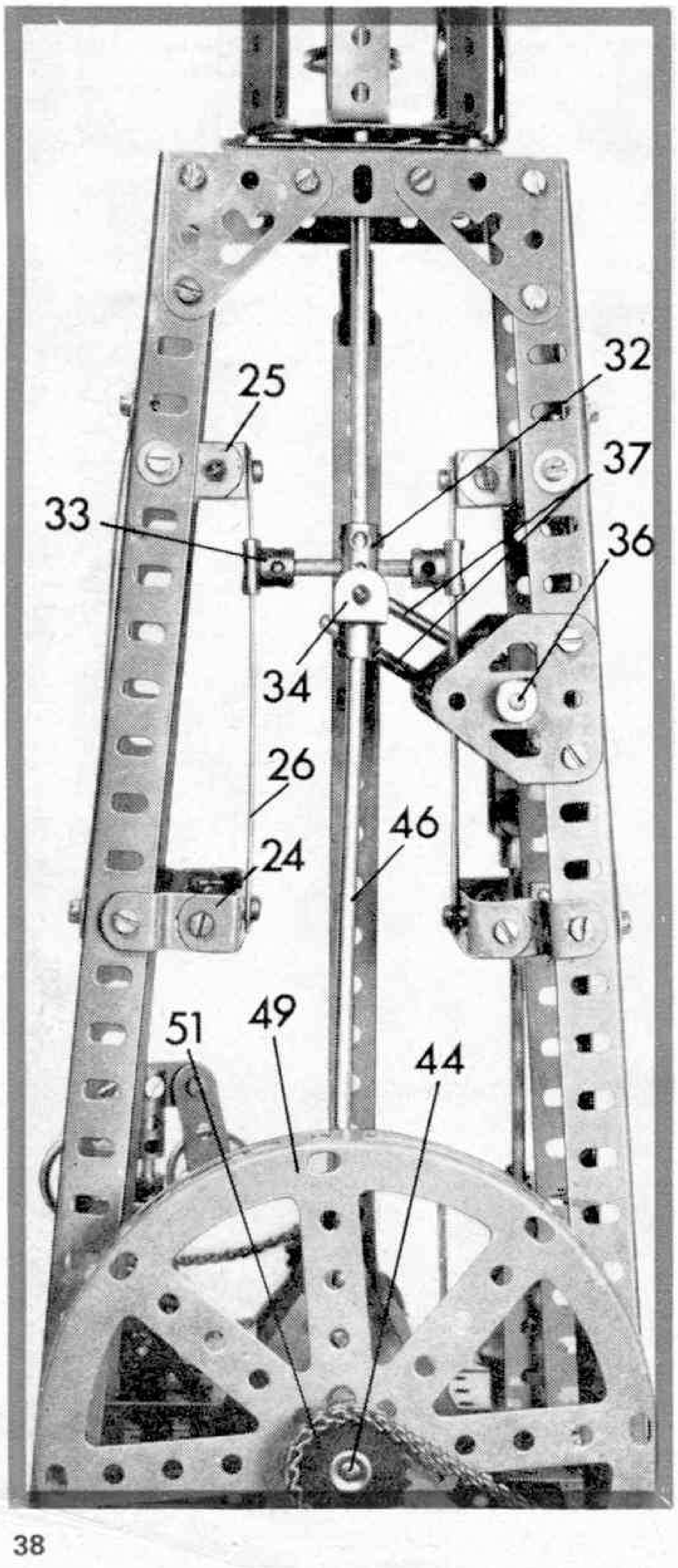
Crankcase and Slide bars

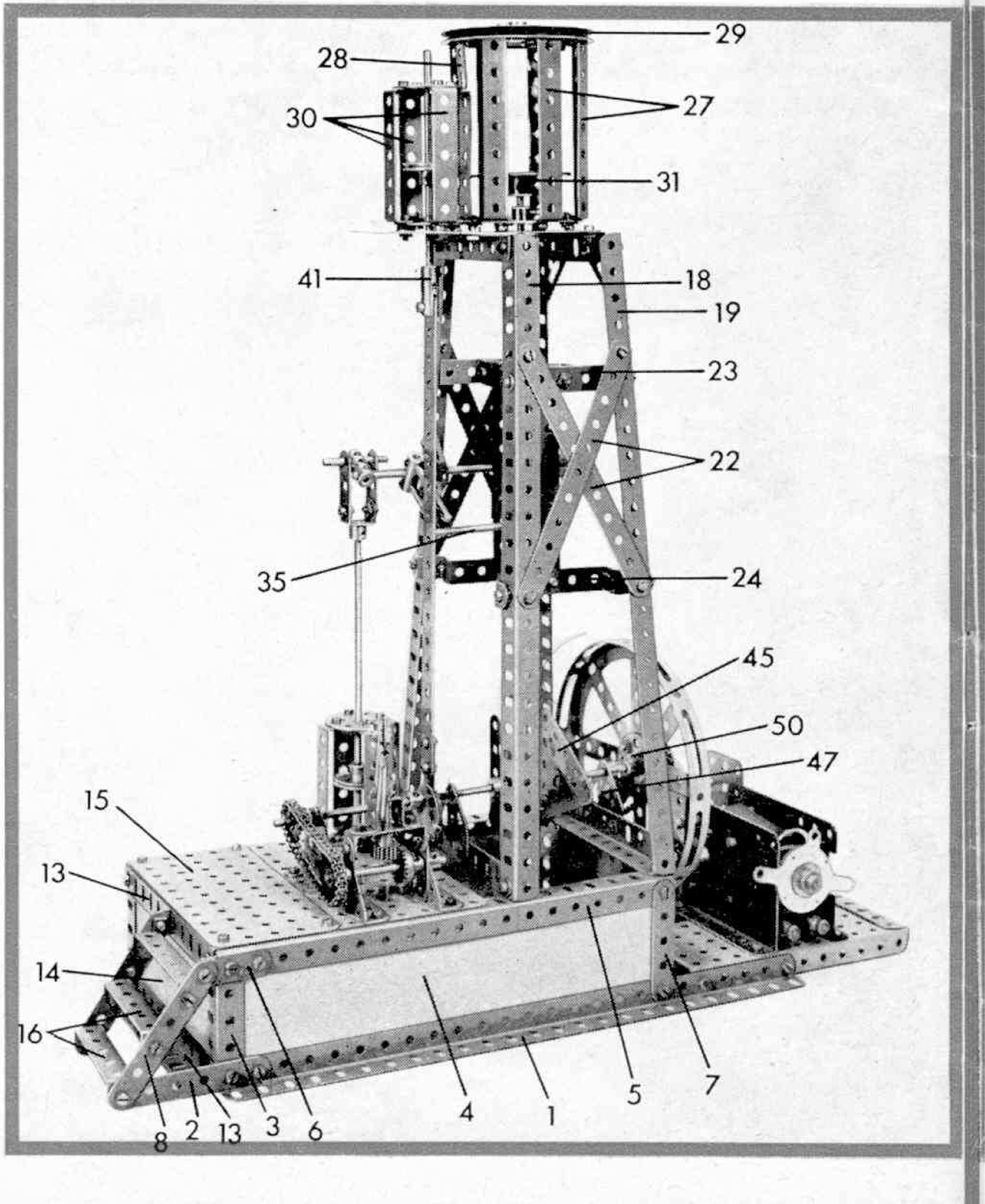
The Crankcase isn't a case in the enclosed sense, but consists simply of two pairs of Angle Girders 18 and 19, each pair made up of two 12 in. Angle Girders joined at the top by a 3½ in. Angle Girder and at the bottom by a 5½ in. Angle Girder 20 bolted between Angle Girders 5 and 10 in the positions shown. A 4½ in. by 2 in. Flat Plate 21 is fixed to the 3½ in. Angle Girders.

Bolted diagonally between Angle Girders 18 and 19 at each side are two 5½ in. Strips 22, while a 2½ in. by ½ in. Double Angle Strip 23 is bolted straight between them. Another similar Double Angle Strip 24, is fixed, by means of ½ in. by ½ in. Reversed Angle Brackets, lower down the Angle Girders, two Spacing Washers on the shank of each of the Bolts securing the Reversed Angle Brackets to the Girders. A 'box' 25 is then built up from two Double Brackets and is bolted to the centre of Double Angle Strip 23, to be joined by a 4½ in. Strip 26 to the centre of Double Angle Strip 24.

Cylinder and Valve Gear

In the case of the Cylinder, seven 3½ in. by ½ in. Double Angle Strips 27 and a 1 in. by ½ in. Angle Bracket 28 are bolted between a 3 in. Pulley 29 and a Faceplate, which is then fixed by two ⅜ in. Bolts to Flat Plate 21. Note, however, that the cylinder is positioned so that the Angle Bracket faces the 'unused' section of the Flat Plate. This unused section is now fitted with the valve cylinder which consists simply of two 8-hole Wheel Discs connected by four 2½ in. by ½ in. Double Angle Strips 30.





Engine with 'Spanner'

The main cylinder piston is represented by a 2 in. Sprocket Wheel 31, mounted on the end of a 6½ in. Rod that slides in the boss of the Face-plate. The lower end of this Rod is fixed part way in the longitudinal bore of a Coupling 32, carrying a 1½ in. Rod in its centre transverse bore. Mounted on each end of this Rod is a Slide Piece 33 which engages with the appropriate slide bar provided by Strip 26. A large Fork Piece is pivotally attached to the lower end of Coupling 32 by a 2½ in. Rod 35, passed through the arms of the Fork Piece and fixed in the lower transverse bore of the Coupling.

At this stage, a 5 in. Rod 36 is held by Collars in the apex holes of two Flat Trunnions bolted to one pair of Angle Girders 18 and 19. Mounted tight on this rod is a Coupling, in the end transverse bores of which two 2 in. Rods 37 are fixed. These Rods pass one each side of Rod 35. Mounted on the end of Rod 36 is another Coupling that carries a 1½ in. Rod in its free end transverse bore. Loose on this Rod are two 1½ in. Strips 38, attached to the lugs of another large Fork Piece, in the boss of which an 8 in. Rod 39 is fixed. This Rod slides in another two 8-hole Wheel Discs joined by four 2½ in. by ½ in. Double Angle Strips 40, representing the pump and bolted to Compound Flat Plate 15. A 1 in. fixed Pulley acts as the piston.

A 1 in. fixed Pulley on a 4½ in. Rod also acts as the piston for the valve cylinder, as can be seen from the accompanying photographs. Fixed on the lower end of the Rod is a Strip Coupling 41, carrying a 12½ in. Strip, to the opposite end of which a Single Throw Eccentric 42 is bolted.

Crankshaft and Governor

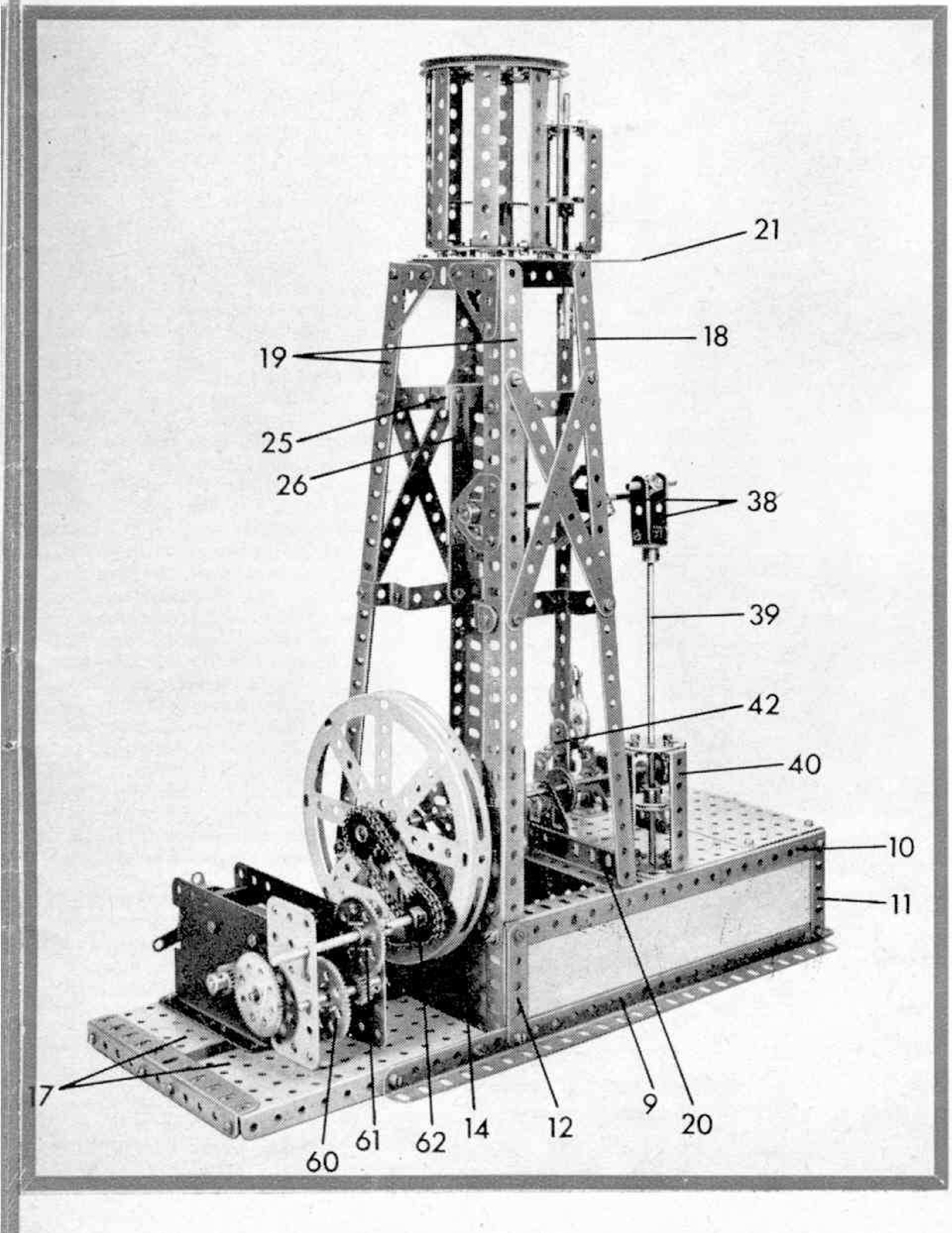
The boss of Eccentric 42 is mounted, tight, on the crankshaft, which is built up from a 5 in. Rod 43 and a 2½ in. Rod 44, the inside end of each of which is fixed in the boss of a Crank bolted to a 2½ in. Triangular Plate 45. Another Crank is bolted to the inside of the Triangular Plate so that its boss coincides with one apex hole, and in this boss is fixed a 1 in. Rod carrying a Coupling 46. Fixed in the longitudinal bore of this Coupling is a 5½ in. Rod 48, the upper end of which is fixed in the boss of Large Fork Piece 34.

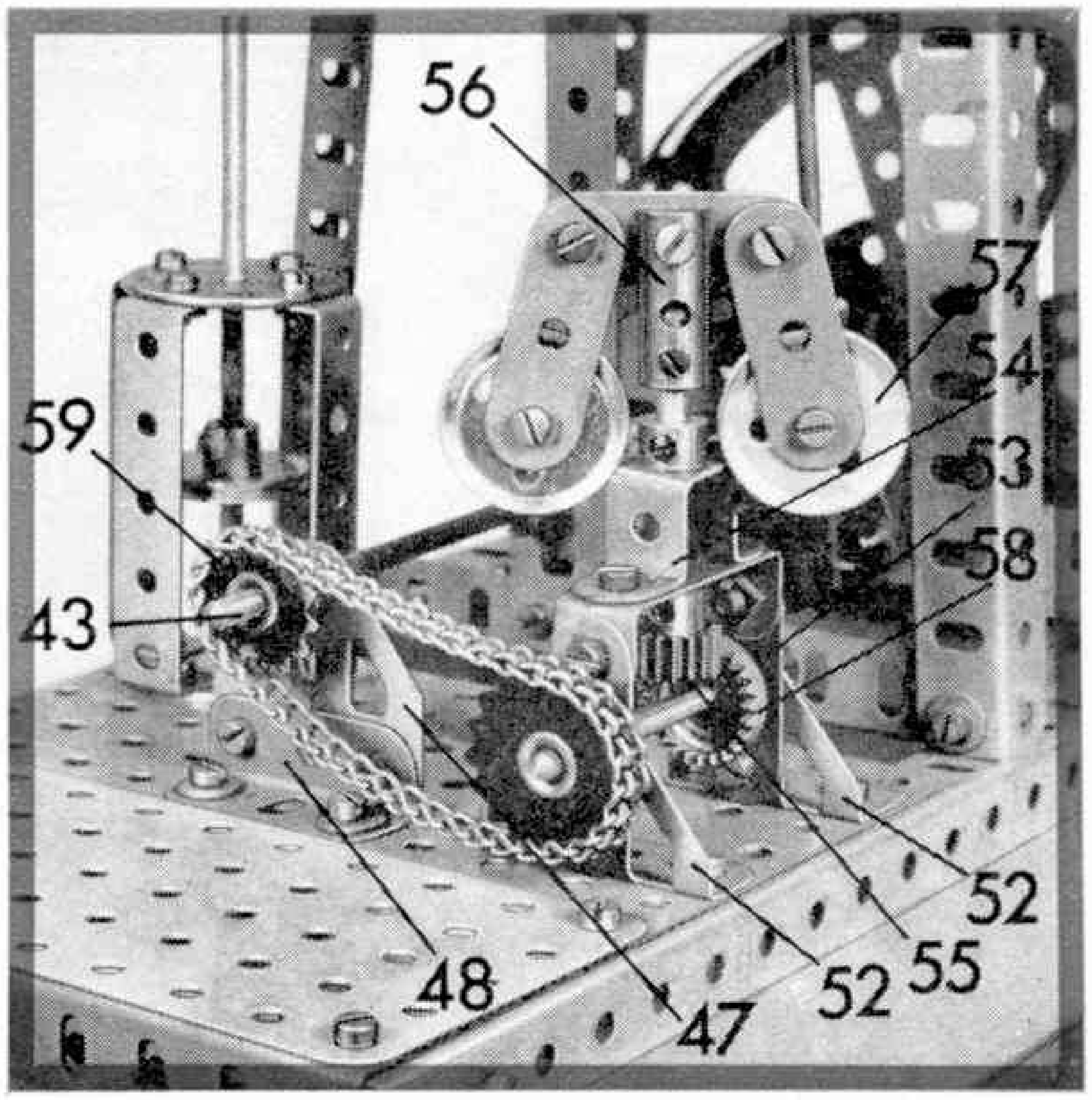
The complete Crankshaft is journalled in three Flat Trunnions 47, two bolted to the 5½ in. Angle Girders fixed between 5 and 10 at the bottom of the crankcase, and the other to a 1½ in. Angle Girder 48 bolted to Compound Flat Plate 15. Collars hold the shaft in place, the Collar at the Compound Flat Plate end being spaced from the Flat Trunnion by three Washers. Mounted on the opposite end of the shaft is the flywheel, obtained from a Hub Disc 49 bolted to an 8-hole Bush Wheel 50, and a 1 in. Sprocket Wheel 51.

Turning to the governor, two Trunnions 52, each extended one hole by a 1½ in. Strip 53, are bolted to the Compound Plate 15. The upper ends of the 1½ in. Strips are joined by a 1½ in. by 1½ in. Double Angle Strip, to the top of which a Double Bent Strip 54 is fixed. Journalled in this and in the Double Angle Strip is a 2 in. Rod, held in place by a Collar and a ½ in. Pinion 55. A Strip Coupling 56 carrying a 1½ in. Strip, is mounted on the top of the Rod, while a further two 1½ in. Strips are lock-nutted one to each end of the first 1½ in. Strip. Two 1 in. Pulleys without Boss 57 are bolted to the ends of these Strips.

In mesh with Pinion 55 is a ¾ in. Contrate Wheel 58 on a 2½ in. Rod journalled in the apex holes of Trunnions 52 and held in place by a Collar and a 1 in. Sprocket Wheel. This Sprocket Wheel is connected by Chain to a ¾ in. Sprocket Wheel 59 on the end of the Crankshaft.

As mentioned earlier, power for the Model is supplied by an E15R Electric Motor bolted to Flanged Plates 17, but the sideplates of the Motor are extended by two 3 in. by 1½ in. Flat Plates to provide bearings for a 3½ in. and a 2 in. Rod. A ½ in. Pinion on the Motor output shaft engages with a 57-teeth Gear Wheel on a 2½ in. Rod, journalled in the Motor sideplates and also carrying a ½ in. Pinion. This Pinion meshes with a 57-teeth Gear Wheel 60 on the above-mentioned 2 in. Rod while another ½ in. Pinion on this Rod engages with another 57-teeth Gear 61 on the above-mentioned 3½ in. Rod, which is held in place by a Collar. A 1 in. Sprocket Wheel 62 on the end of this Rod is connected by Chain to Sprocket Wheel 51 on the crankshaft.





Parts required

1 of No. 1a
4 of No. 2
2 of No. 2a
3 of No. 4
2 of No. 5
8 of No. 6a
6 of No. 8
2 of No. 8a
7 of No. 9
1 of No. 9b
5 of No. 9d
1 of No. 9f
4 of No. 11
1 of No. 12b
1 of No. 13a
1 of No. 14
1 of No. 14a
2 of No. 15
1 of No. 15a
1 of No. 16
4 of No. 16a
4 of No. 17
2 of No. 18a
1 of No. 18b
1 of No. 19b
2 of No. 22
2 of No. 22a
1 of No. 24
4 of No. 24a
4 of No. 26
3 of No. 27a
1 of No. 29
170 of No. 37a
158 of No. 37b
36 of No. 38
1 of No. 45
1 of No. 48
15 of No. 48a
7 of No. 48b
2 of No. 50
2 of No. 52
1 of No. 53a
5 of No. 59
4 of No. 62
4 of No. 63
2 of No. 63b
1 of No. 70
2 of No. 73
2 of No. 76
1 of No. 94
3 of No. 96
1 of No. 96a
1 of No. 109
6 of No. 111c
2 of No. 116
1 of No. 118
4 of No. 125
2 of No. 126
5 of No. 126a
1 of No. 130a
2 of No. 133
2 of No. 197
1 E15R Electric Motor

Building Bangthorn-4-Trackwork

by Mike Rickett

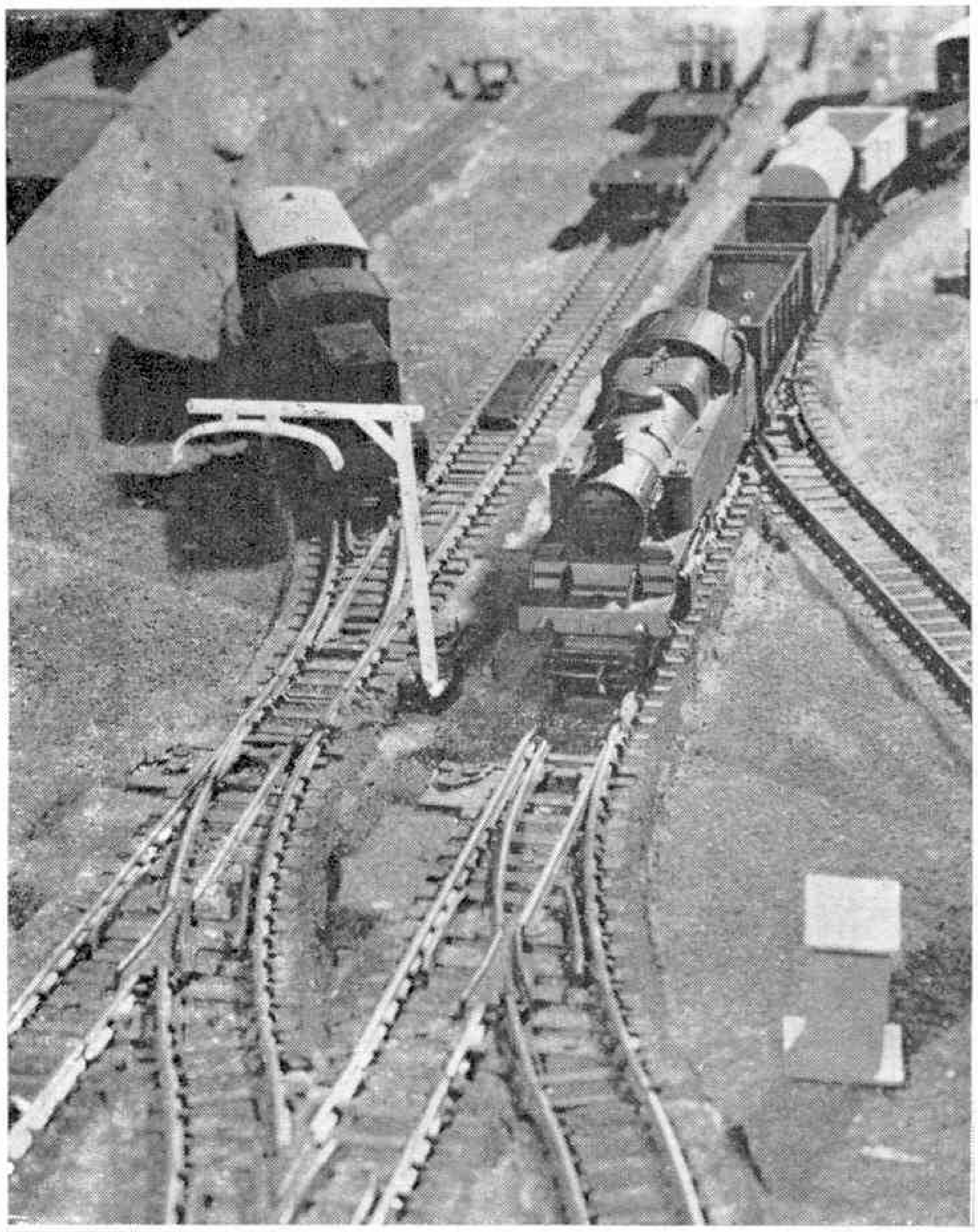
Components List: 1 R.H. Point R.491. 5 L.H. Points R.490. 6 Long Straights R.489. 10 Straights R.481. 2 Double Curves R.483. 6 Double Straight R.480. 6 Half Curves R.484. 6 Quarter Straight. 1 Underlay R.434. 5 Underlay R.433. 3 Underlay R.410. 4 RT.207. List includes 4 Straight R.481 rails for cutting up.

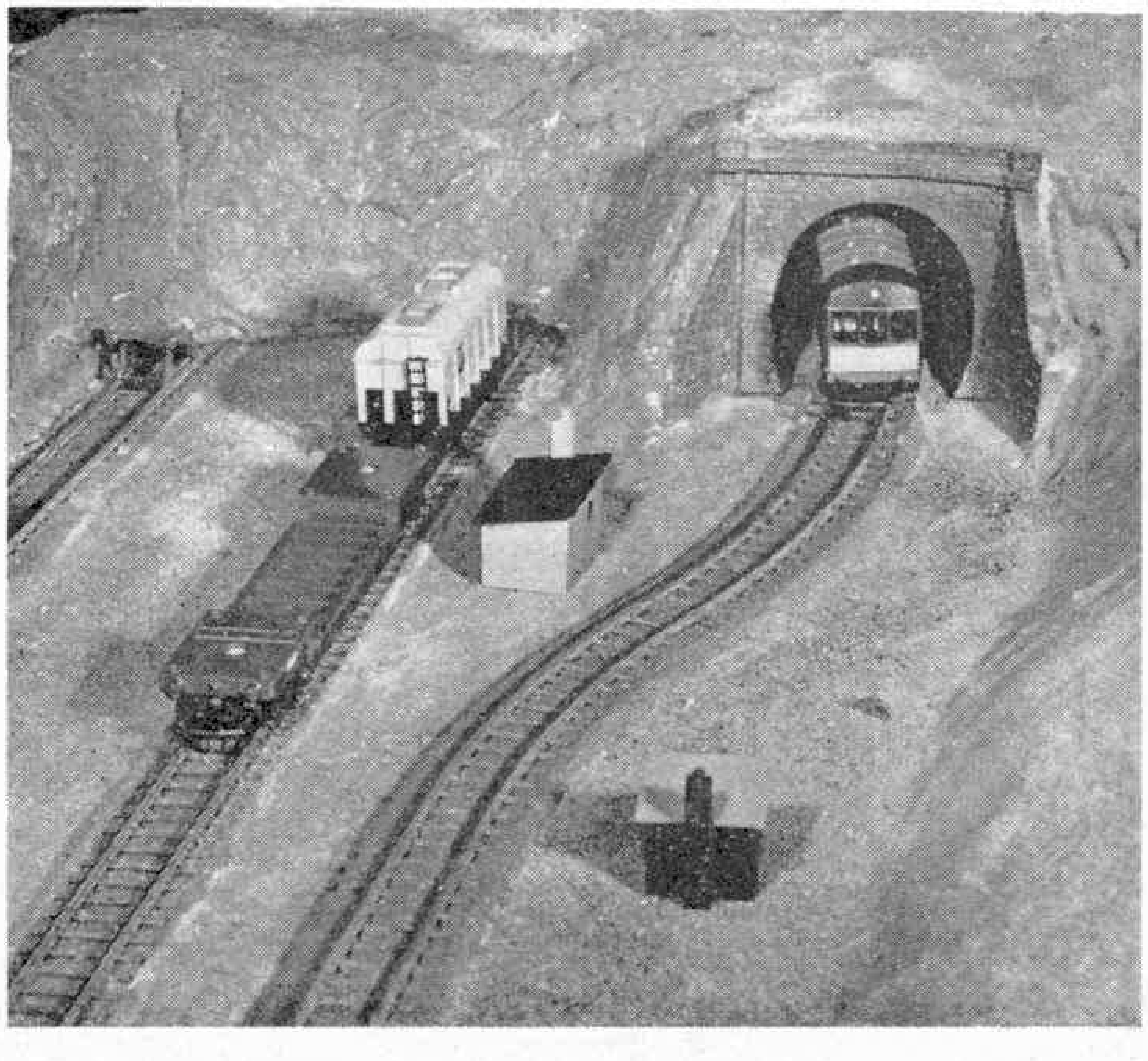
BEFORE we describe the fourth stage in the building of "Bangthorn", I would like to mention a new model that recently arrived at this office for review. A new addition to the Tri-ang Hornby Battle Space series, it is called a Radar Tracking Command Car and is No. 567 in the catalogue, which readers will remember, was described last month. Mounted on a four wheel chassis, the car is surprisingly heavy for its size and is painted a bright blue with the Battle Space monogram of rocket and machine gun on both sides. Like most wagons in the Battle Space range, it includes several working features, one of which, a revolving radar scanner mounted on the roof, operates as the wagon moves along the track. This is done by a rather clever device mounted under the wagon and which is, no doubt, partly responsible for the wagon's extra weight. The other feature is an observatory bubble or dome on the roof, which also lights up once the track power is switched on. The model has a great amount of detail, including ventilation grilles and rivetting detail and it costs 19 shillings.

Stage four of "Bangthorn" concerns the track on both the station and traverser baseboards and you will see from the plan and components list, the items of track required and their various positions on the layout. We have used throughout, the Tri-ang Super 4 track system which has many advantages as far as a layout of this sort is concerned. It is for one thing, a sturdy track system that will withstand a great deal of rough treatment, while at the same time, it is quite realistic, especially when used with a foam ballast underlay. Another advantage in its favour is its electrical simplicity.

Tri-ang Super 4 points are self isolating which means that sidings and other sections of track are not supplied with current unless the point is switched in their direction. This of course greatly reduces the amount of switching required.

Supplied only for hand operation, the points are available in left, right or Y types, all of which can be electrically operated simply by the addition of a motor which clips easily onto each point. Because of the electrical simplicity of Tri-ang Hornby points, wiring is greatly simplified and the track system lends itself to operation on "Cab Control" principles, about which I will be saying more next month. Both track and points have steel rails for the unique Magnadhesion system and a nylon sleeper base is used. Chemicals such as Carbon Tetrachloride and Trychlorethylene should not, therefore, be brought into contact with the nylon base, because they will melt and distort the sleepers.



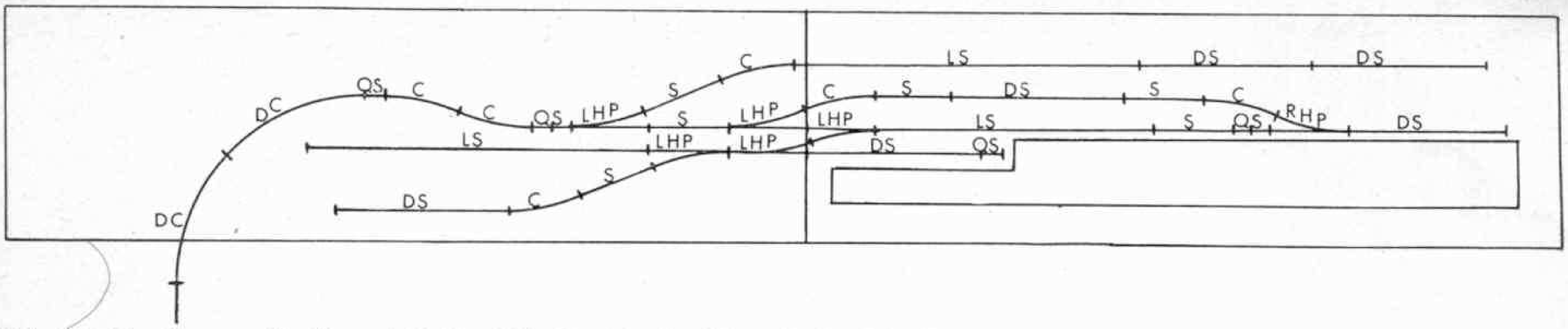


Marking out the positions of the track on the baseboard surface and drawing what is, in effect, a full size track plan, greatly aids the actual laying of track, and although this does not have to be done too accurately, every effort should be made to show the correct positions of points. Dimensions of the various track components to help with this are given in the Tri-ang Hornby catalogue.

The baseboard join on the station section is the most difficult part of the station layout, and because this must be accurate, you would be well advised to start from here. Because the two sections fold over, all fishplates must be removed from both points and track, and photos B and C show how this can be done.

It is, in fact, advisable to have a dummy run first, simply laying the track and points over the baseboard to see that the track joints coincide with the baseboard joint. When you are quite satisfied, take the points and track and remove the fishplates from these items. Fishplates are fitted to Tri-ang Hornby track in two ways. One type, usually seen on points, is spot-welded, and the other is simply clipped on to the rail by two metal strips that are bent downwards over the sides of the rail and through the square hole in the sleeper base. For track with this type of fitting, therefore, and also for fishplates on some points, it is only necessary to bend down the end of the sleeper base, gently lift up the rail and bend up the two metal pieces along its sides. The fishplate can then quite easily be pulled from the end of the rail, as shown in photo C. For spot-welded fishplates, such as those shown in photo B, you simply insert a screwdriver blade in the fishplate gap and then twist either clockwise or anticlockwise, to cause the fishplate to break into pieces that can afterwards be pulled off. When the fishplates have been removed from the rails over the baseboard joint, they can be slipped back into their former positions.

Ballast undoubtedly improves the appearance of track and the foam strip variety is both clean and easy to lay. Tri-ang make an excellent ballast strip for straight and curved track, and this is available in



DC—Double Curve. **C**—Curved Rail. **DS**—Double Straight. **S**—Straight Rail. **QS**—Quarter Straight. **LS**—Long Straight. **RHP**—Right Hand Point. **LHP**—Left Hand Point.

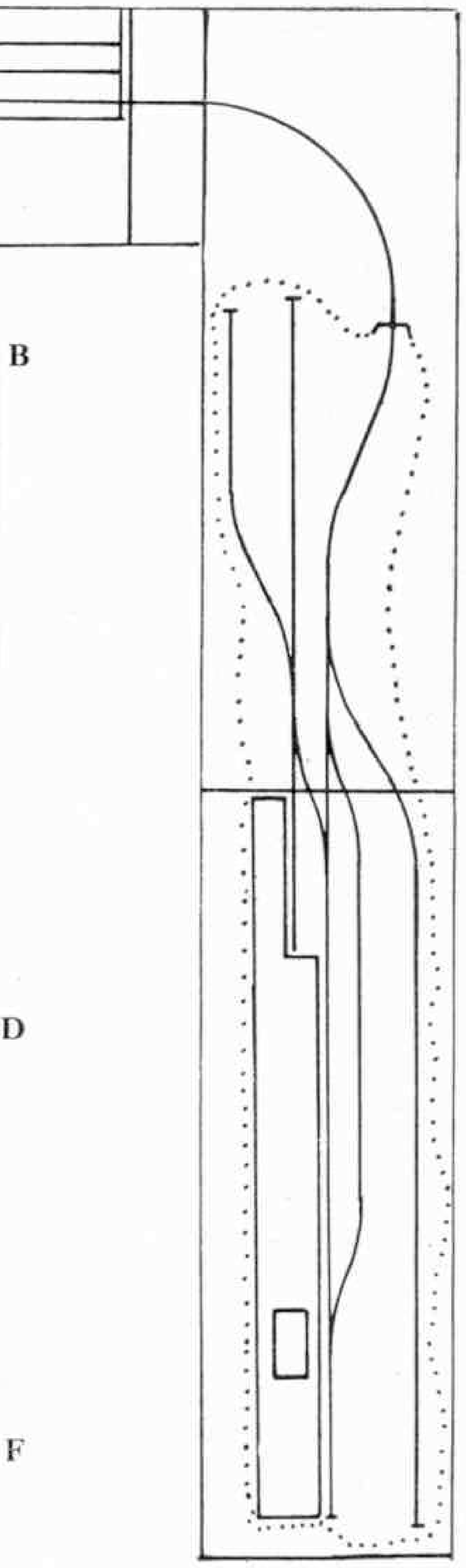
16 ft. 6 ins. long rolls at a cost of 7s. 1d. per roll. This is specially made for Tri-ang Super 4 track and the ballast is raised up round the sleepers so that the track is bedded in the ballast in a realistic way. Special ballast underlays are made for all Tri-ang points, left, right hand and Y, and these have space for the Tri-ang point motor unit. Ballast strip can be glued to the baseboard with a white P.V.A. adhesive, as shown in photo D, or you can, if you wish, pin the track to the baseboard without gluing the underlay down as shown in photo G. Whichever method you choose, lay the track from the joint in the baseboard station sections as shown in photo E. It is most important for its joints to coincide exactly as shown in the plan and in photo E, and you must also be most careful when pinning down to ensure that rail is all at the same height and level. This is especially important at the baseboard join because derailments will occur if any rail end protrudes above its neighbours.

Another feature of Tri-ang Hornby track and points is that the end sleepers on the plastic base have a projecting piece which normally helps the bases to clip together and which you can see on Photo C. Because the rails over the track joint have got to part easily, this is an undesirable feature, and you should cut off this projecting piece with a modelling knife, so that points part easily.

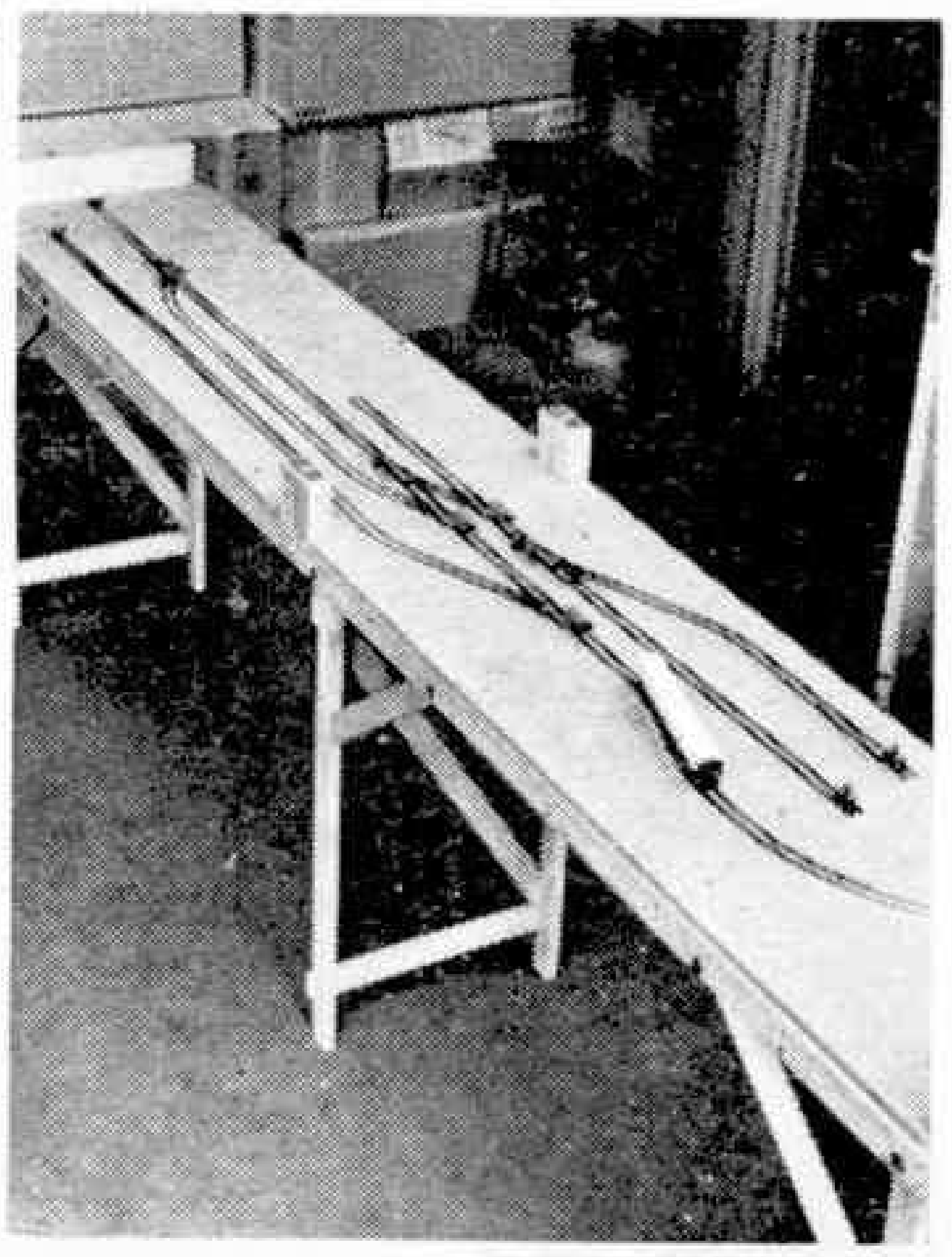
Once you are quite satisfied with the arrangement of track over the baseboard joint, fix it in position with Tri-ang Hornby track pins over the underlay and lay the remaining components for the station layout on its ballast underlay. For the traverser section, you should cut three short pieces of track for each end of the three traverser sidings to make them the correct length. Once again, the fishplates must be removed from the ends of the rails at each end of the traverser and its adjoining tracks. To cut the track, use a fine toothed hacksaw or backsaw, as shown in photo F. and keep the saw vertical to avoid leaving any angled faces on the rail ends. For the points near the central baseboard joint you will probably find it necessary to drill one or two holes so that track pins can be inserted to stop any movement, either up, down, or side to side as in photo H. This also applies to the track at either side of the other baseboard joints which must also be quite immovable and at the same height, so that rolling stock runs both smoothly and freely over them. It is in fact, a good idea to use a coach as a test vehicle over track joints because they are usually very sensitive to differences of level and will derail easily over inaccurately laid sections of track.

One further length of track will need to be cut from a standard Tri-ang Hornby curved rail for the section between the station and traverser baseboard, as shown on the plan. If the height of the rail between the traverser and adjacent section is slightly different, pack up the track underneath the foam underlay with layers of paper or thin cardboard.

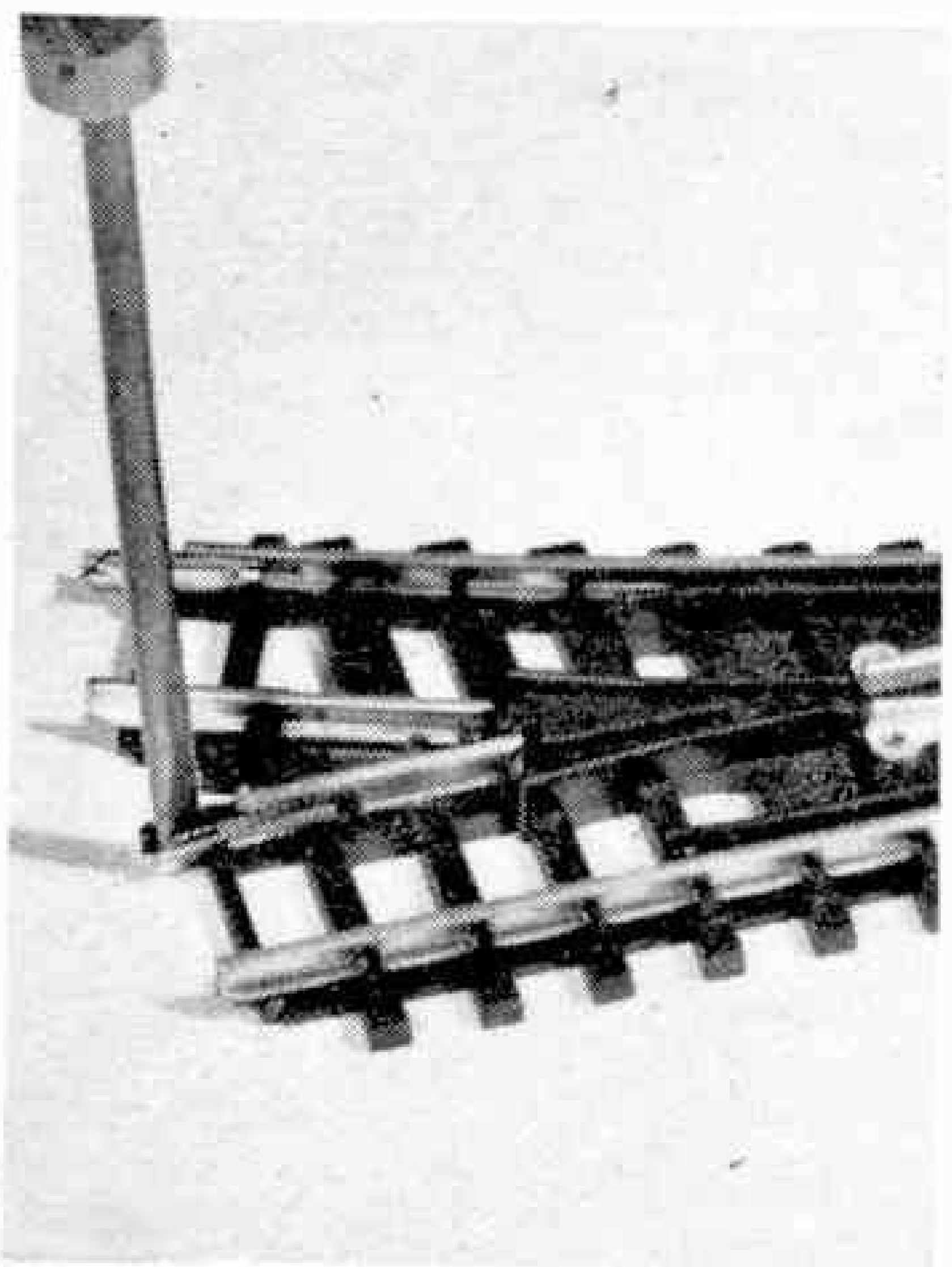
The lengths of track on the traverser baseboard can be glued down direct to the wooden base and it is quite unnecessary to use any foam underlay. Because the base of the traverser section is plywood, I would not in fact recommend pinning unless holes were previously drilled to receive track nails.



A



B



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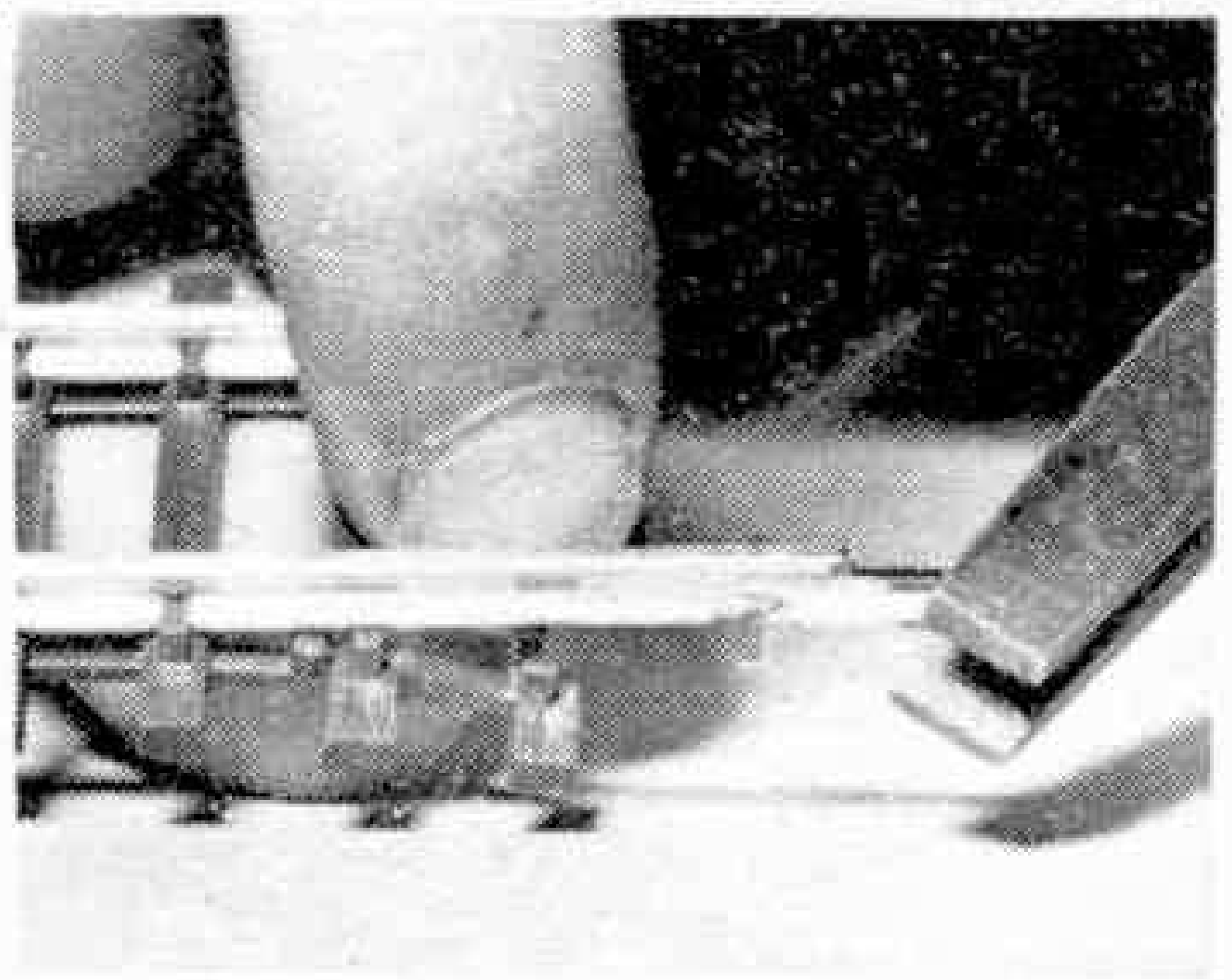

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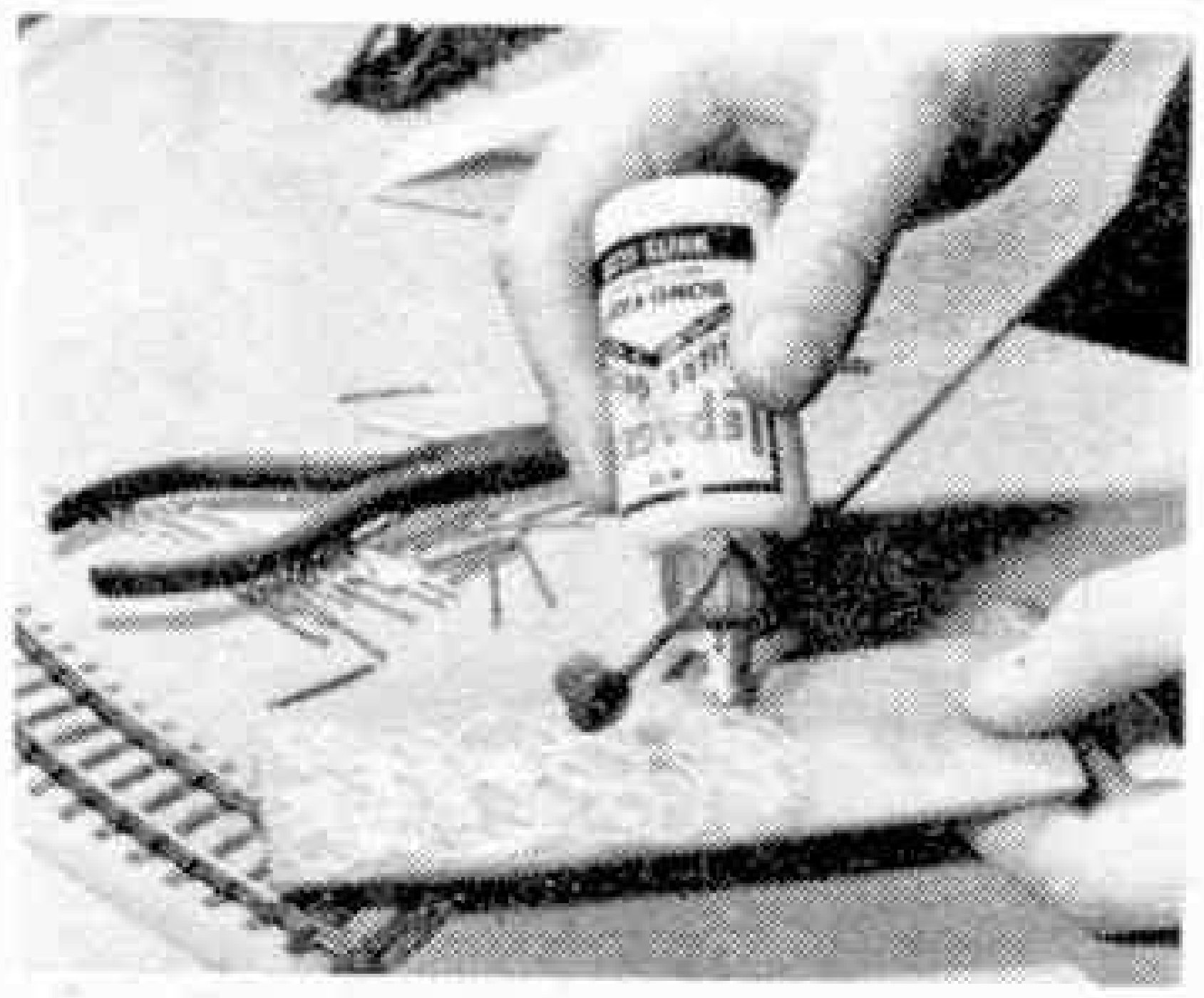

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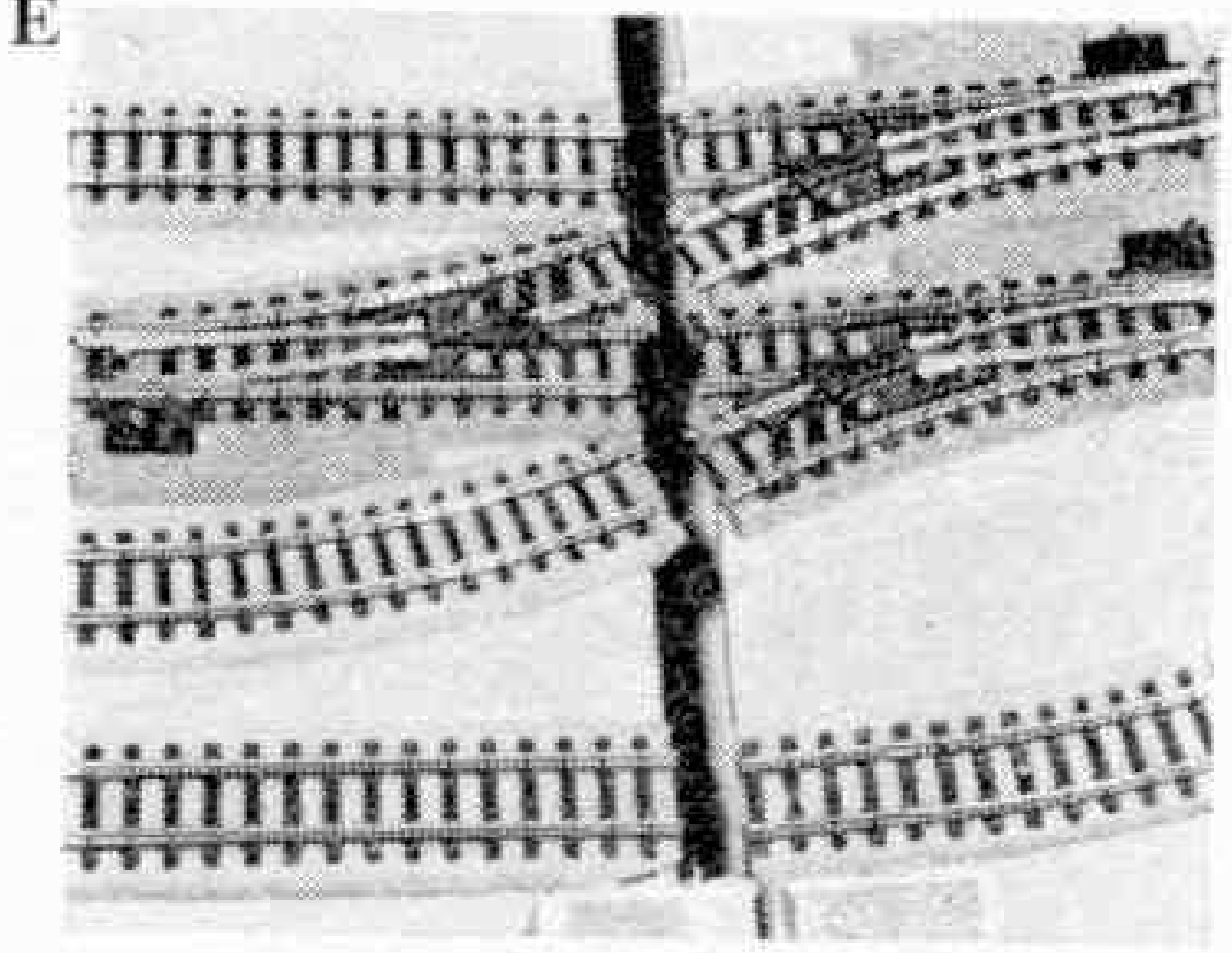

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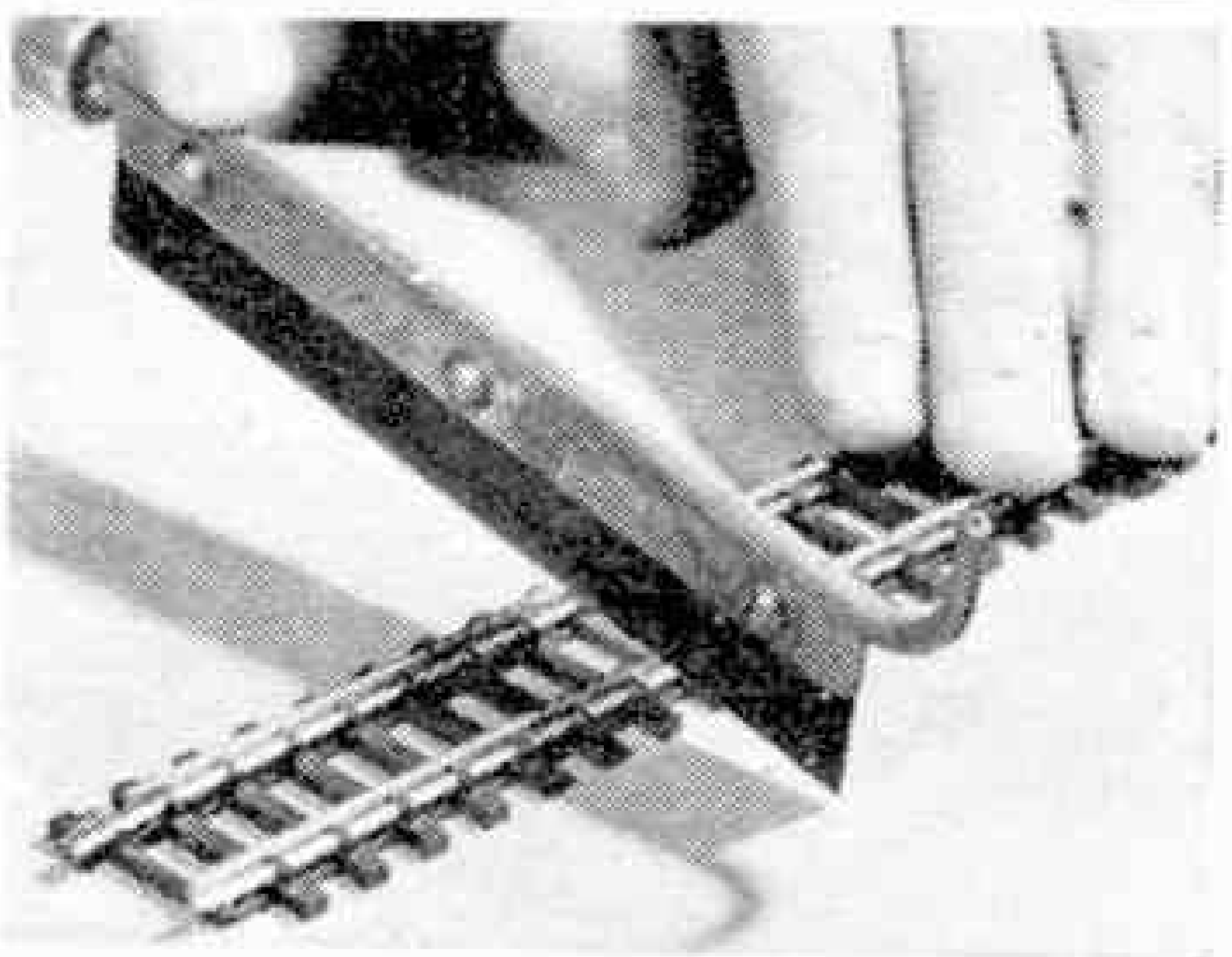

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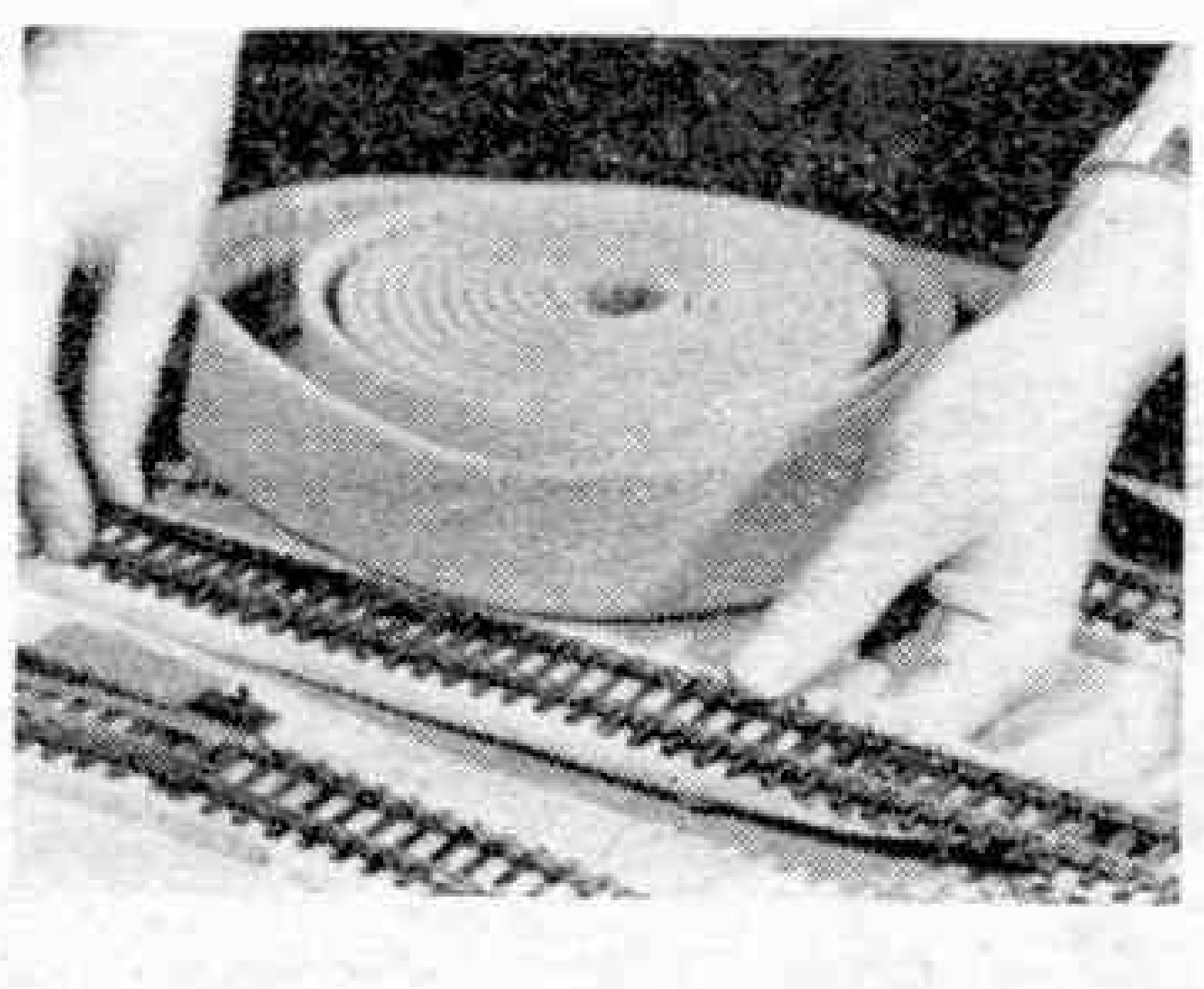

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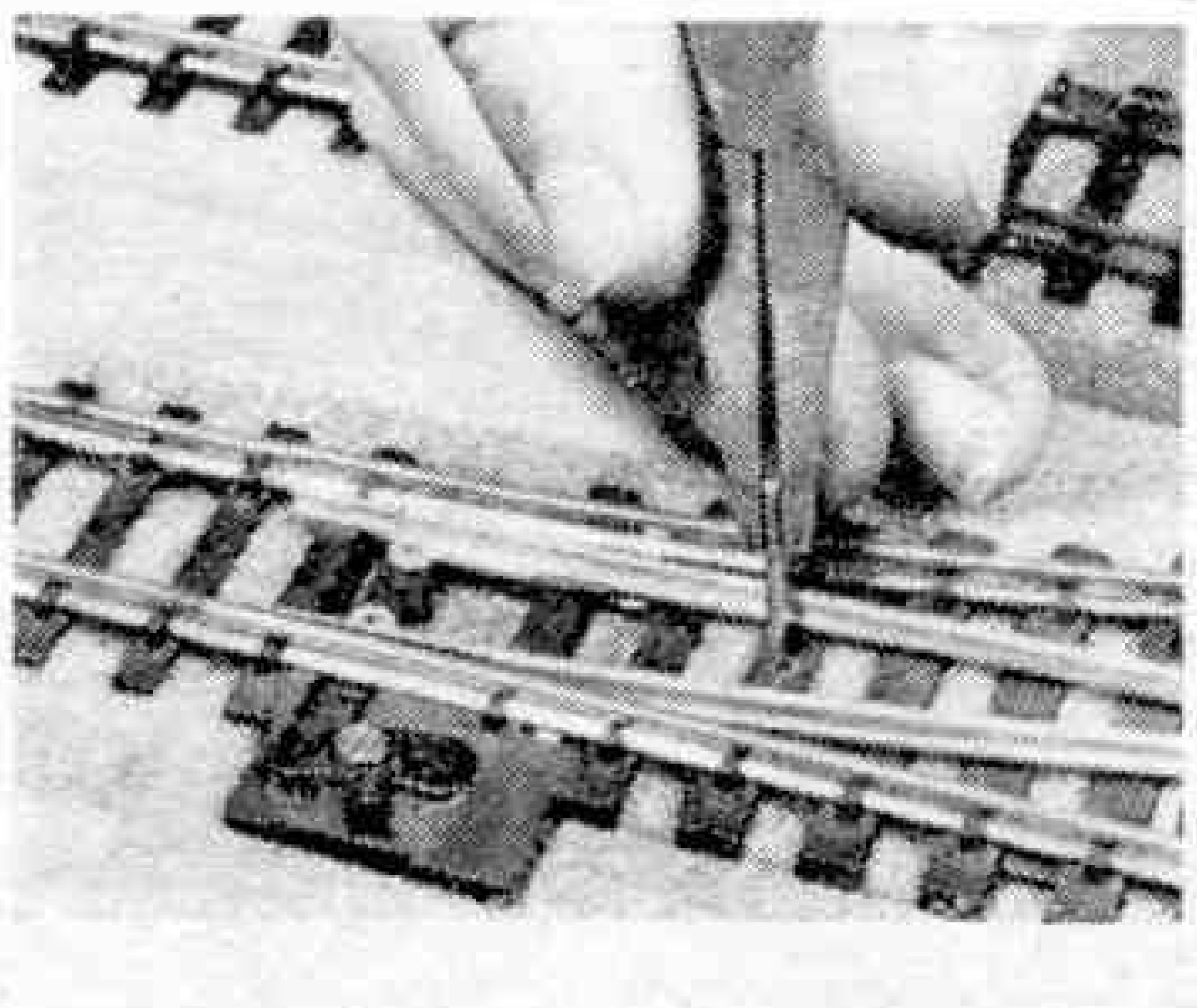


PENNY A TUNE

By Spanner

DEFINITELY not having a good singing voice, I never thought I'd see the day when a sweet musical refrain would be heard drifting melodiously from the cluttered confines of my office—but it's happened and for only a penny, at that! Nor did it come from a singing secretary out to make a bit of money. Instead it was produced by a rather magnificent Musical Box, described below, which is built up mainly from Meccano parts and powered by a Meccano E.15.R Electric Motor. When 'fed' with a penny, it plays the first few bars of 'The Bells of St. Mary's'. One of the beauties of the machine, however, is that it is not limited to a particular tune. In fact, it will play the first 40 notes of any tune that falls within one octave of a scale, as will become obvious as the building instructions progress.

Generally speaking, the model can be split into five basic sections: framework, drive unit and gearbox, keyboard, roller and start/stop unit. Dealing first with the framework, one side is built up from two 14 in. compound angle girders 1 joined by two 3½ in. Angle Girders 2, the intervening space being enclosed by a 14 in. by 2½ in. compound strip plate 3. Each compound girder 1 is obtained from a 12½ in. and a 4½ in. Angle Girder, while the compound strip plate is obtained from a 12½ in. by 2½ in. Strip Plate extended three holes by a 2½ in. by 2½ in. Flexible Plate.

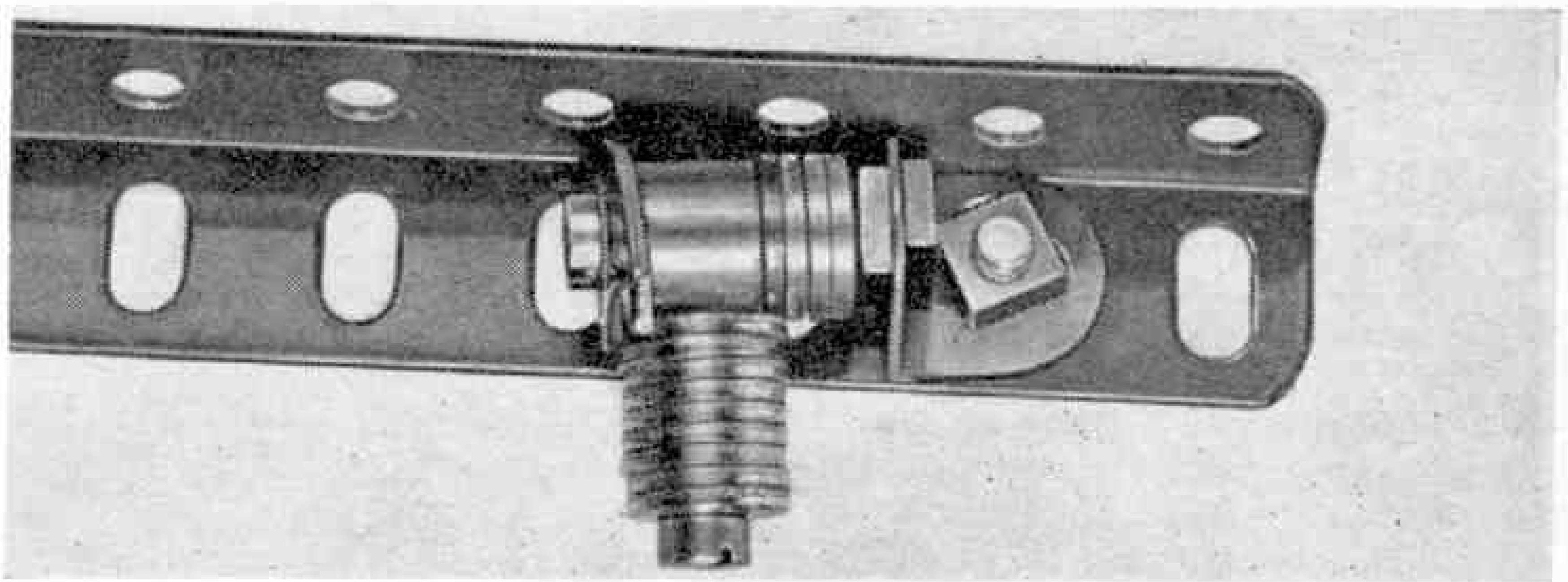
The other side of the framework is also built up from two 14 in. compound angle girders 4, joined by two 3½ in. Angle Girders and incorporates a compound strip plate. This last, however, is built up from a 9½ in. by 2½ in. Strip Plate and a 2½ in. by 2½ in. Flexible Plate, overlapped two holes, and is therefore only 11 in. long by 2½ in. wide. It is edged at one end by a 3½ in. Strip 5. Another two 3½ in. Strips 6 are then bolted between girders 4, a distance of three holes separating them, as shown, while a 1½ in. Flat Girder 7 is bolted to upper girder 4.

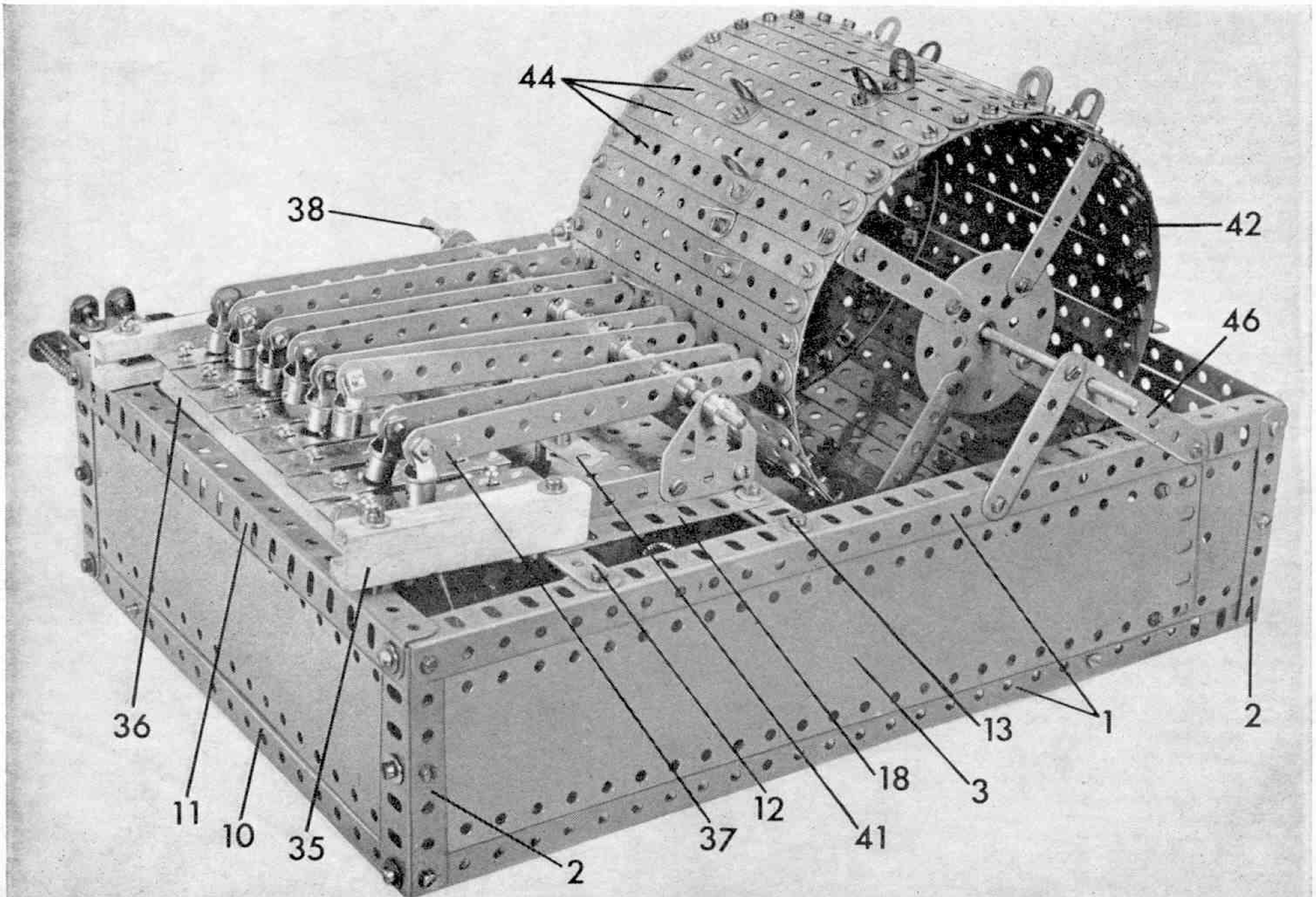
Both sides are now joined at one end by a 9½ in. Angle Girder 8, a 9½ in. by 2½ in. Strip Plate and a 9½ in. Strip 9, and at the other end by two 9½ in. Angle Girders 10 and 11, as well as a 9½ in. by 2½ in. Strip Plate. Another 9½ in. Strip 12 is bolted between upper girders 1 and 4 through their sixth holes, while a 9½ in. Angle Girder 13 is fixed between them through their twelfth holes. Lower girders 1 and 4 are connected through their eleventh holes by a 9½ in. Angle Girder 14, which is then joined to Girder 10 by two 5½ in. Angle Girders 15. One of these Girders is in turn connected to lower girder 4 by a 3½ in. by ½ in. Double Angle Strip 16, while the other Girder is connected to lower girder 1 by a 4 in. Strip 17. Bolted between Strip 12 and Girder 13 are two 3½ in. Angle Girders 18 and a 5½ in. by 3½ in. Flat Plate 19.

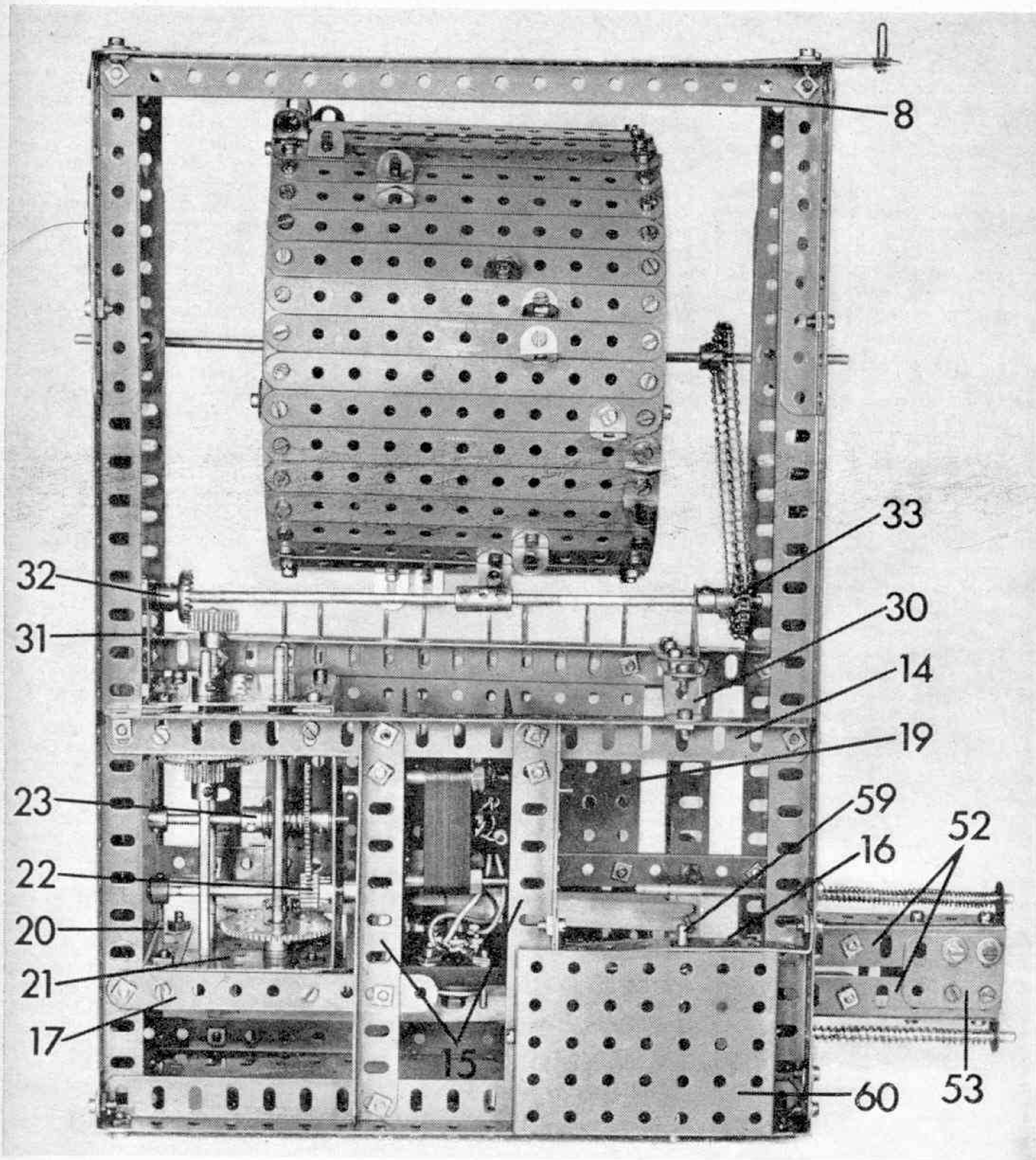
Drive unit and gearbox

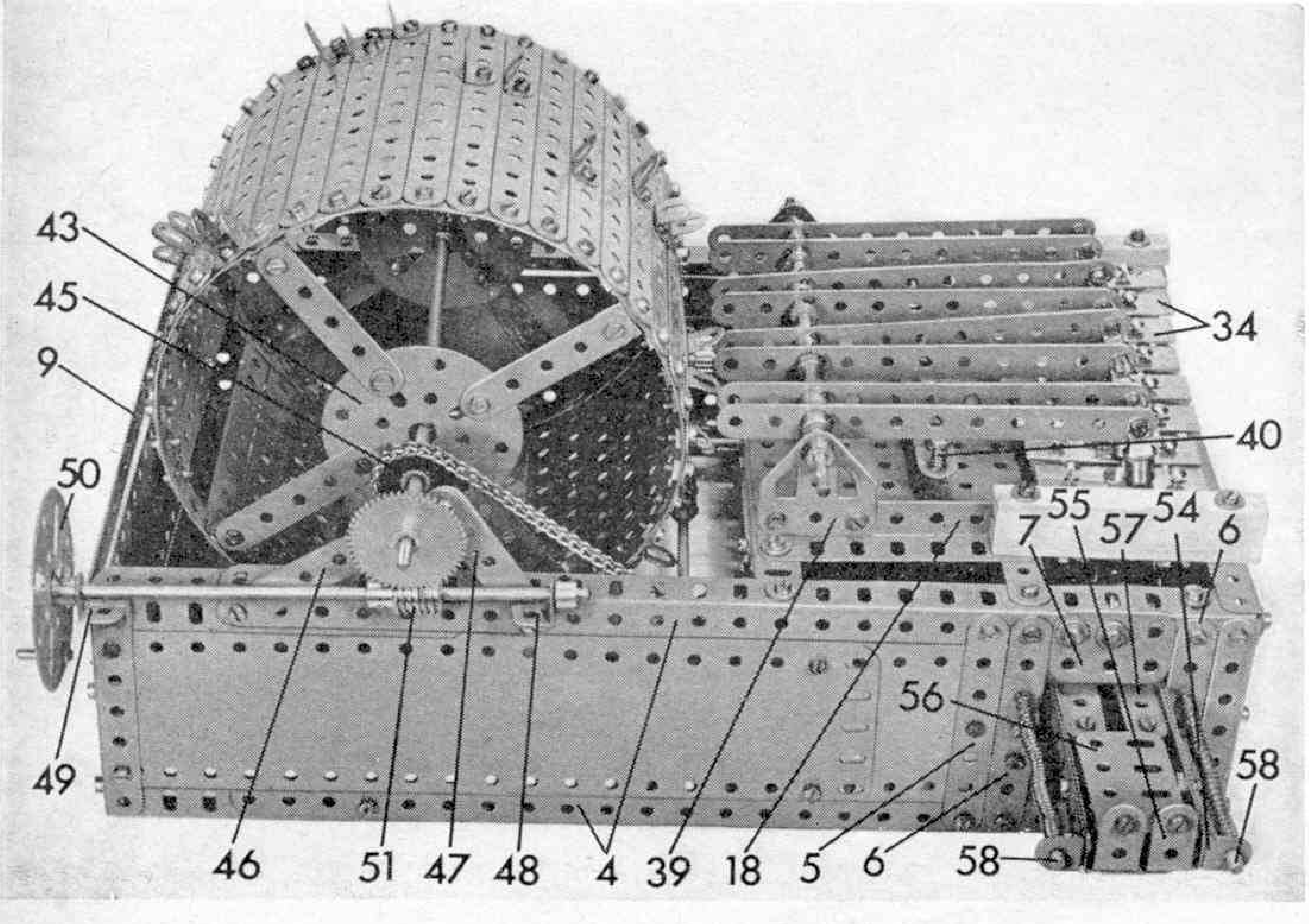
In this particular case the drive unit, as such, needs no description—it consists quite simply of a Meccano E.15.R Electric Motor bolted to Angle Girders 15—but the gearbox most certainly does. The casing is easily built up from two 3½ in. by 2½ in. Flanged Plates 20 joined by two 2½ in. by 2½ in. Flat Plates 21, the complete item then being attached to Angle Girder 14 and Strip 17 by Angle Brackets. A ½ in. Pulley on the Motor output shaft is connected by a 2½ in. Driving Band to a 1 in. Pulley on a 3½ in. Rod journalled in Flanged Plates 20, and held in place by a Collar and a ½ in. Pinion 22. In mesh with this Pinion is a 57-teeth Gear Wheel on a 3 in. Rod, also held in the Flanged Plates by a Collar and carrying a Worm 23. Engaging with this Worm is another ½ in. Pinion on a 4½ in. Rod 24, journalled in Flat Plates 21 and held in place by a Collar outside one of the Plates and a ½ in. Pinion inside the Plate. This Pinion meshes with a 57-teeth Gear 25 on another 4½ in. Rod journalled in the Flat Plates, which itself also carries a ½ in. Pinion. This Pinion engages with a third 57-teeth Gear 26 fixed along

The device ensuring that the penny drops from the sliding tray when the tray is returned to its normal position









with a ½ in. Pinion 27 on a third 4½ in. Rod held by Collars in the Flat Plates. Pinion 27 engages with a final 57-teeth Gear Wheel 28 on a 5 in. Rod, held in Flat Plates 21 by a Collar at one end and a Coupling 29 at the other end. The Rod is fixed in the longitudinal bore of the Coupling.

At this stage a 3½ in. Strip is bolted to Angle Girder 13 and is attached to Angle Girder 14 by a Double Bracket 30. Another 3½ in. Strip 31 is bolted to one Flanged Plate 20, so that it projects three holes beyond the Plate, as shown, then a 9 in. compound rod is journalled in the end hole of this Strip and in the apex hole of a Trunnion bolted to the Strip attached to Double Bracket 30. The compound rod is built up from a 5 in. and a 4 in. Rod, joined by a Coupling and carries a ¾ in. Contrate Wheel 32, spaced from Strip 31 by three Washers. This Contrate Wheel meshes with a ¾ in. Pinion mounted on the end of the Rod carrying Gear Wheel 28. On the other end of the compound rod is fixed a Collar and a 1 in. Sprocket Wheel 33.

Keyboard

Next we come to the keyboard which is actually the only non-Meccano section of the model. In a word, it consists simply of a xylophone and, in fact, a child's small 'toy' xylophone could be used. We, however, built up the unit from eight ready-made metal xylophone platens 34 (obtainable from most music shops), held by steel pins on a wooden frame, each platen being loose on its pins and resting on pieces of string running the length of the frame. All the platens were ⅝ in. wide and ranged in length from 3 in. to 2⅛ in. Together they gave the complete scale of C in one octave.

For the xylophone framework four lengths of wood are required, two with approximate dimensions of 7 in. by ½ in. by ⅜ in., and two with dimensions of 3¼ in. by ¾ in. by ⅜ in., also approximate. Each short length 35 has a longitudinal slot cut in it which is about ¼ in. deep and 1/5 in. wide, while both ends of each long length 36 are sufficiently slotted to enable the short and long lengths of wood to be locked together, as shown. Before the framework is assembled, however, a small hole is drilled towards each end of each long length of wood. A piece of string is threaded through these holes, is pulled as tight as possible, then the short lengths are forced into position to hold the string in place.

If necessary, glue can be applied to complete the framework but, before doing so, remember to arrange the long lengths of wood so that they converge slightly to allow for the different lengths of xylophone platens which get progressively shorter as the note rises higher in the scale. The finished xylophone is fixed to Girder 11 and Strip 12 by 1⅛ in. Bolts passed through holes drilled in the short lengths of wood.

Eight hammers are next each built up from a 5½ in. Strip 37, to one end of which an End Bearing is fixed. All these Strips are then mounted on an 8 in. Rod 38, each Strip being loosely held by two Collars placed one each side. The Rod, which passes through the third holes in the Strips, is journalled in the apex holes of two Flat Trunnions 39, bolted to Angle Girders 18.

As you probably know, a xylophone will not produce a correct note if the hammer, after striking the platen, is allowed to remain in contact with it. A device has therefore been fitted to the model which lifts the hammers clear of their respective platens immediately they have struck them. It consists quite simply of eight Pivot Bolts 40, each carrying a Compression Spring on its shank, mounted loose in a 5½ in. Strip 41 which is fixed about 3/5 in. above Flat Plate 19 by Nuts on ¾ in. Bolts. Each Pivot Bolt/Compression Spring unit should be arranged so that it is not too strong to prevent the hammer from hitting the platen at the initial 'strike', but should have sufficient power to lift the hammer clear of the platen immediately it has made the 'strike', and to prevent it bouncing several times on the platen.

Moving on to the roller, this, of course, determines the tune to be played, or, at least, the quantity and position of Angle Brackets bolted to the roller does. The basic roller is built up from two 'wheels', each consisting of four 5½ in. Strips 42, bolted together and shaped to form a circle. Four 2½ in. Strips are fixed to Strips 42, in the positions shown by Angle Brackets, their other ends being bolted to a Face Plate 43. The 'wheels' are then joined by 40 5½ in. Strips 44 to complete the roller which is then mounted on an 11½ in. Rod that also carries a 1 in. Sprocket Wheel 45, connected by Chain to Sprocket Wheel 33.

The Rod is held by Collars in the second holes of two 3½ in. Strips 46 bolted, one each, to compound angle girders 1 and 4 and braced by 2½ in. Strips 47, also bolted to the compound angle girders. The Bolt fixing Strip 47 to compound girder 4 also holds a left-hand Corner Angle Bracket 48 in place and this, along with a right-hand Corner Angle Bracket 49 bolted to the corner 3½ in. Angle Girder, provides a bearing for a 6½ in. Rod held in place by a Collar and a Face Plate 50, in which a Threaded Pin is fixed. A Worm 51, on the Rod, engages with a 50-teeth Gear on the end of the 11½ in. Rod forming the axle of the drum.

This last arrangement, as you will probably have realised, is actually a hand-drive system which has been included for the benefit of readers who would like to build the model but who do not own a Motor. If used, it does, of course, do away with the need for the gearbox, but, at the same time, makes the model a far less impressive construction. If, on the other hand, the Motor and gearbox are included and the hand-drive is used, Sprocket Wheel 45 must be loosened so that it does not prevent the drum from turning. Alternatively, when the Motor is in operation, the 50-teeth Gear Wheel must be removed.

In operation, the hammers are actuated by Angle Brackets, bolted to the drum, which strike against Strips 37 and, as already mentioned, the quantity and positions of these Angle Brackets determine the tune to be played. Assuming you want the model, like our example, to ring out the charming notes of 'The Bells of St. Mary's', you will require 31 Angle Brackets bolted one to each of the required Strips 44 of the roller. The positions of these Angle Brackets I can best describe by simply listing the hole in the Strip in which the Angle Bracket is fixed.

Looking at the roller from the xylophone end of the model, counting the holes in the Strips from the right and working from Strip to Strip upwards, the holes are as follows: 1st, 1st, 2nd, 4th, 4th, 0, 7th, 8th, 8th, 0, 10th, 11th, 11th, 0, 8th, 7th, 7th, 0, 4th, 5th, 5th, 0, 7th, 0, 4th, 0, 1st, 2nd, 1st, 11th, 10th, 8th, 7th, 5th, 4th, 2nd, 1st, 0, 0. It is important to remember, incidentally, that all the Angle Brackets are fixed to the roller by their short lugs and that slight variations in the 'timing' of the notes can be obtained by bending the long lugs of the Brackets.

All that remains to be built is the start/stop mechanism that allows the roller to make one complete revolution when the model is fed with a penny. A sliding tray is obtained from two 3½ in. Angle Girders 52, joined by a 1½ in. Flat Girder 53. A 3½ in. by ½ in. Double Angle Strip 54 and a 1 in. by 1 in. Angle Bracket 55 is bolted to each Angle Girder, then a 2 in. Flat Girder 56 is attached to Angle Brackets 55 by ½ in. by ½ in. Angle Brackets. Fixed to the horizontal flange of each Angle Girder 52 by a ½ in. Bolt are two 1½ in. Strips 57, one on top of the other, seven Washers on the shank of the Bolt spacing the Strips from the Girder. The completed tray will be mounted on two 5½ in. Rods 58, held in the bosses of Cranks bolted to the inside of Strips 6 at one side of the model framework, but it is advisable to finish the internal linkage before doing this.

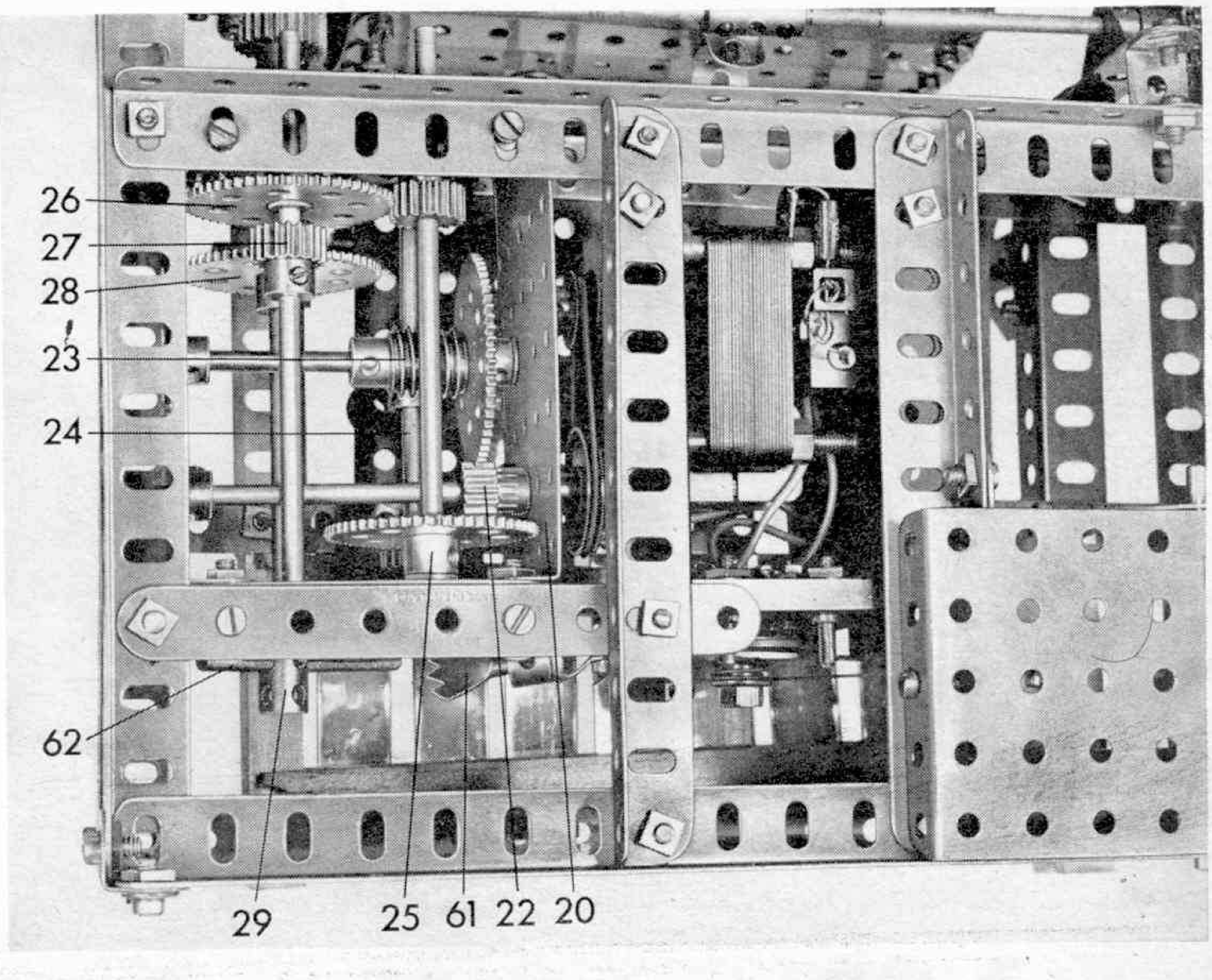
First of all a simple device for ensuring that the penny drops from the sliding tray when the tray is returned to the normal position is obtained from a Pawl with boss mounted on a ¾ in. Bolt held by two Nuts in an Angle Bracket bolted to Upper Girder 4. The Bolt passes through the longitudinal bore of the Pawl boss which is spaced from the first Nut by four Washers. A counterweight is provided by nine Washers on the shank of a ½ in. Bolt screwed into one tapped bore of the Pawl boss. If positioned correctly the Pawl should 'dangle' behind and in the centre of Flat Girder 7. Next, one end of a 3½ in. Strip is lock-nutted to the centre arm of the Motor switch while the other end of the Strip is lock-nutted through the second hole of another 3½ in. Strip to the lower end of which a Crank is bolted. This Crank is mounted on a 3 in. Rod 59, journalled in Girder 10 and Double Angle Strip 16, then a container for the pennies is provided by a 3½ in. by 2½ in. Flanged Plate 60 attached to appropriate Angle Girder 15 by two Nuts on a ¾ in. Bolt.

Before the sliding tray can be mounted in place, two return springs are required. We used two suitable lengths of light springing, obtained from most hardware stores, but several Compression Springs separated by Washers would do equally as well. The tray is fitted by holding it in position with the end lugs of Double Angle Strips 54 behind the bosses of the Cranks bolted to the inside of Strips 6. Rods 58 are then passed through the other lugs of Double Angle Strips 54, the return springs are added and the Rods are finally fixed in the bosses of the Cranks with approximately two inches protruding at the other side.

Lastly, an End Bearing carrying a Centre Fork 61 is bolted, tight, to the right-hand arm of the Motor switch while a Flexible Coupling Unit 62 is fixed in the centre transverse bore of Coupling 29. The theory of the start/stop unit should now become evident. When a penny is placed in the sliding tray and the tray pushed in, the penny should press against the 3½ in. Strip attached to the Crank mounted on Rod 59. This, in turn, moves the Motor switch to the 'on' position, and the model begins to play. However, the gearing is so arranged that Coupling 29 revolves at exactly the same speed as the roller so that, provided Flexible Coupling Unit 62 is positioned correctly, it should strike against Centre Fork 61 and turn the Motor off after the drum has made one complete revolution.

Parts Required

2 of No. 1a
55 of No. 2
1 of No. 2a
8 of No. 3
10 of No. 5
4 of No. 6a
4 of No. 8
5 of No. 8a
2 of No. 9
4 of No. 9a
8 of No. 9b
1 of No. 11
39 of No. 12
2 of No. 12a
1 of No. 13
1 of No. 13a
1 of No. 14
2 of No. 14a
1 of No. 15
3 of No. 15a
1 of No. 15b
1 of No. 16
2 of No. 16b
1 of No. 22
1 of No. 23a
1 of No. 25
4 of No. 26
1 of No. 26c
1 of No. 27
3 of No. 27a
1 of No. 27d
1 of No. 29
2 of No. 32
242 of No. 37a
236 of No. 37b
70 of No. 38
3 of No. 48b
1 of No. 52a
3 of No. 53
35 of No. 59
3 of No. 62
2 of No. 63
1 of No. 65
2 of No. 72
1 of No. 94
2 of No. 96
1 of No. 103g
2 of No. 103h
3 of No. 109
3 of No. 111a
1 of No. 115
3 of No. 126a
1 of No. 147a
8 of No. 147b
1 of No. 154a
1 of No. 154b
9 of No. 166
1 of No. 175
1 of No. 186
2 of No. 190
3 of No. 196
1 of No. 197
1 E15R Electric Motor
1 Xylophone



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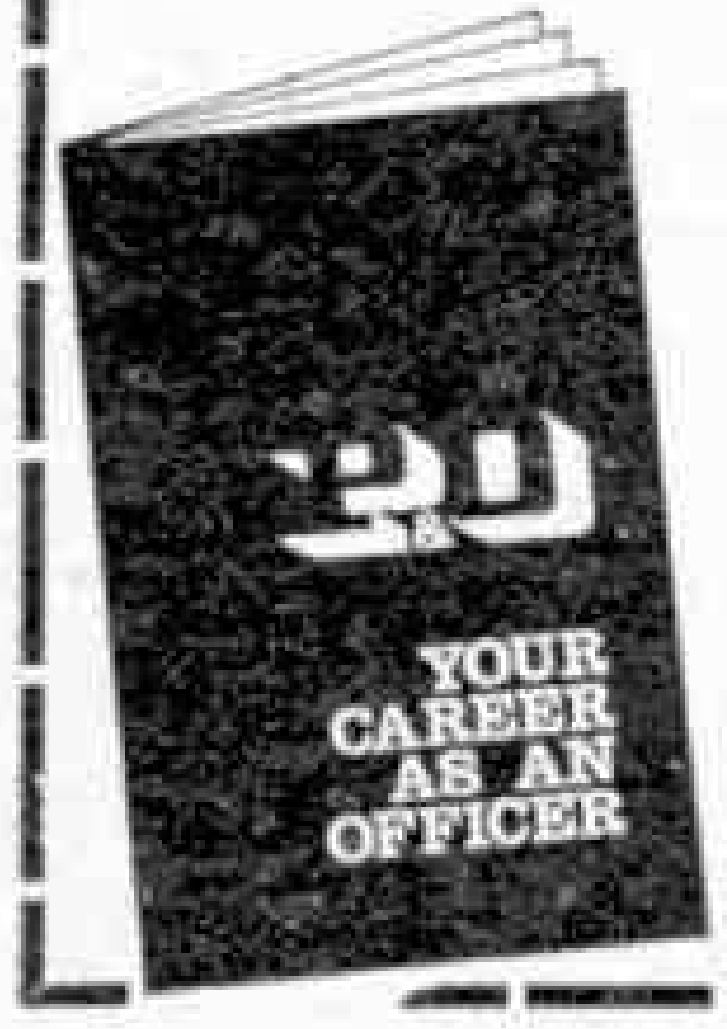

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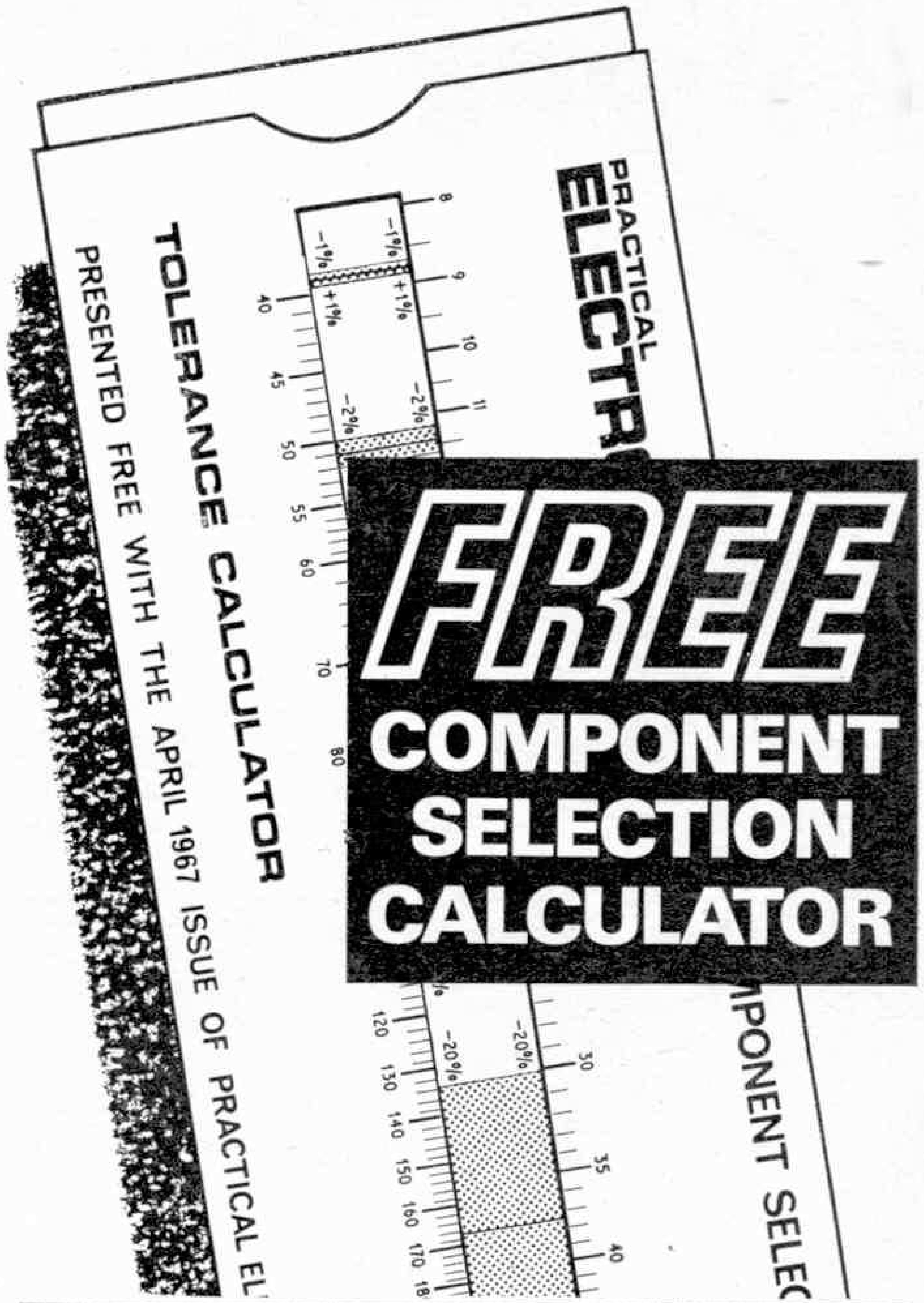

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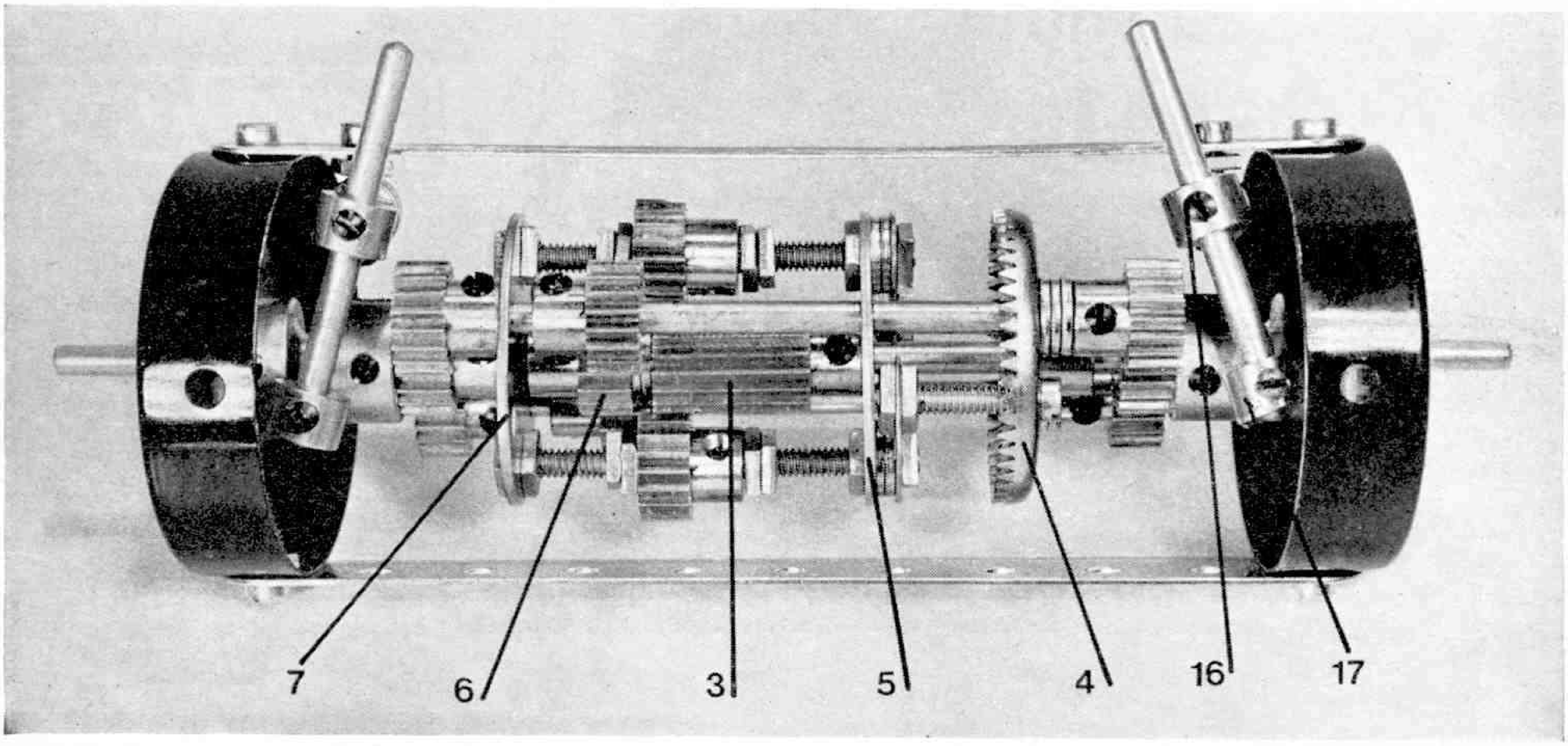
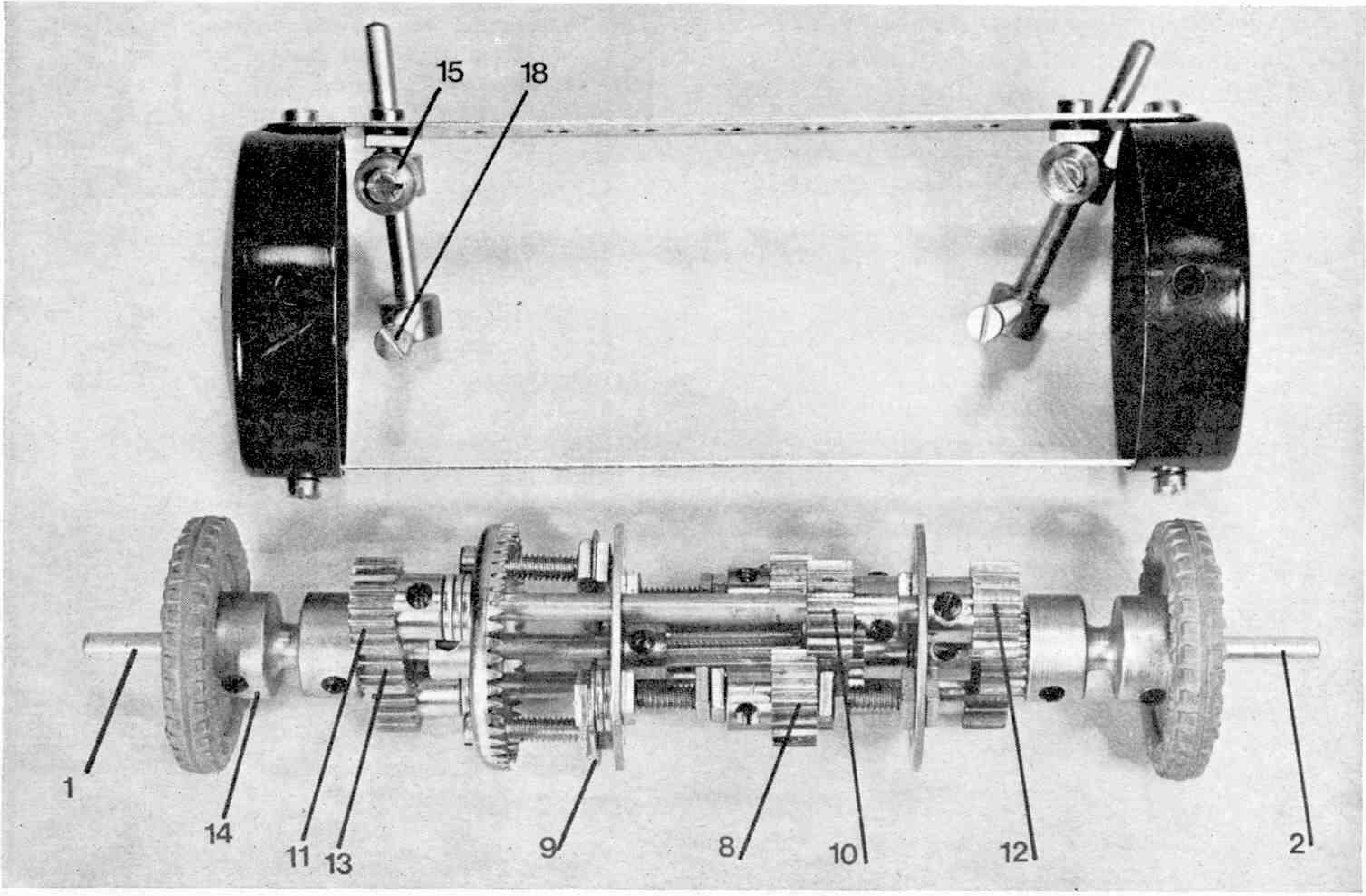
PRACTICAL ELECTRONICS

Among the Model Builders

with 'Spanner'





MECCANOMEN familiar with the general mechanics and layout of the motor car will have heard of a differential and, indeed, will know it to be a mechanism that allows the driving wheels of a car to revolve at different speeds, thus enabling the car to corner correctly. I learned recently, however, that the well-known French AMX 13-ton Tank incorporates a special type of differential which is used to control the steering mechanism of the Tank and which, as I see it, enables both tracks of the Tank to be powered by one engine. This is of particular interest from a Meccano point of view as a similar mechanism fitted to a Meccano tank, such as the model we featured last August, would halve the cost involved in driving the model. (If you remember, the model referred to was fitted with two Emebo Motors, one to each track, and was steered by stopping one or other of the Motors.)

Thanks to the ingenuity of an M.M. reader overseas, a Meccano mechanism based on that fitted to the AMX Tank is now in existence. The reader in question is Mr. A. Capet of le Havre, France, and he has very kindly sent me full details of his design. I have had a sample unit built up and feature it here as the first of this month's offerings. You may question its 'differential' description when looking at its planetary gear construction, but, as Mr. Capet puts it, 'The basic principle is, as usual, the one of retarding a side whilst the other goes on moving'—a perfect description of the differential! Actual construction of the mechanism is not difficult provided all the correct parts are available. The length of the main axle, of course, depends on the model in which the unit is to be fitted, but, in our case, consisted of two 3½ in. Rods 1 and 2. Rod 1 is fixed, tight, in the boss of a ¾ in. face, ½ in. Pinion 3 and carries a 1½ in. Contrate Wheel 4 and a 6-hole Wheel Disc 5, both loose on the Rod. At the other side, Rod 2 is inserted part way into Pinion 3 and is left free to turn. Slipped onto the Rod are two Collars, to be followed by a ½ in. Pinion 6, which is fixed in place, and a 6-hole Bush Wheel 7, left loose.

Bush Wheel 7 and Wheel Disc 5 are now joined as shown by two 2 in. Screwed Rods, mounted loose on each of which is a ½ in. Pinion 8, held in place by two sets of lock-nuts. Pinion 8 should be positioned so that they both mesh with Pinion 3 and come as close as possible to Pinion 6 without actually meshing with it. Fixed on one end of each Screwed Rod is a Fishplate 9, spaced from Wheel Disc 5 by two Washers, to the other end of which Contrate 4 is attached by a ¾ in. Bolt, the Contrate and Wheel Disc being separated by as great a distance as the shank of the Bolt will allow.

Journalled in diametrically opposite holes of Contrate Wheel 4, Wheel Disc 5 and Bush Wheel 7 are two 3½ in. Rods, both carrying a fixed ½ in. Pinion 10 and both held in place by further ½ in. Pinions 11 and 12. Pinions 11 in each case are spaced from Contrate 4 by three Washers. Pinions 10 must be so positioned on their Rods that they mesh with Pinion 6 and appropriate Pinion 8 but, under no circumstances, must they mesh with Pinion 3. Next, a simple clutch unit is built up from a ½ in. Pinion 13, with its Grub Screw removed, which is fixed tight in one end of a Socket Coupling 14. Fixed in the other end of this Socket Coupling is a 1 in. Pulley with boss, also minus its Grub Screw, that carries a Motor Tyre. The unit is then mounted, loose, on Rod 1, Pinion 13 engaging with Pinions 11. Another similar clutch unit is produced and is mounted on Rod 2 with the Pinion engaging with Pinions 12.

A casing is provided by two Boiler Ends 14, connected by two 5½ in. Strips. Fixed to each of these Strips are two Collars 15, each carrying a ½ in. Bolt in its longitudinal bore, the Bolt securing the Collar to the Strip being prevented from fouling the ½ in. Bolt by a Nut. The shank of the ½ in. Bolt points upwards and is screwed into another Collar 15 fixed on a 2 in. Rod 16, a Nut on the shank of the Bolt helping to secure it in place. Fixed on the inside end of Rod 16 is a third Collar 17 into one transverse tapped bore of which a ¾ in. Bolt 18 is screwed. This Bolt engages with the slot in Socket Coupling 14.

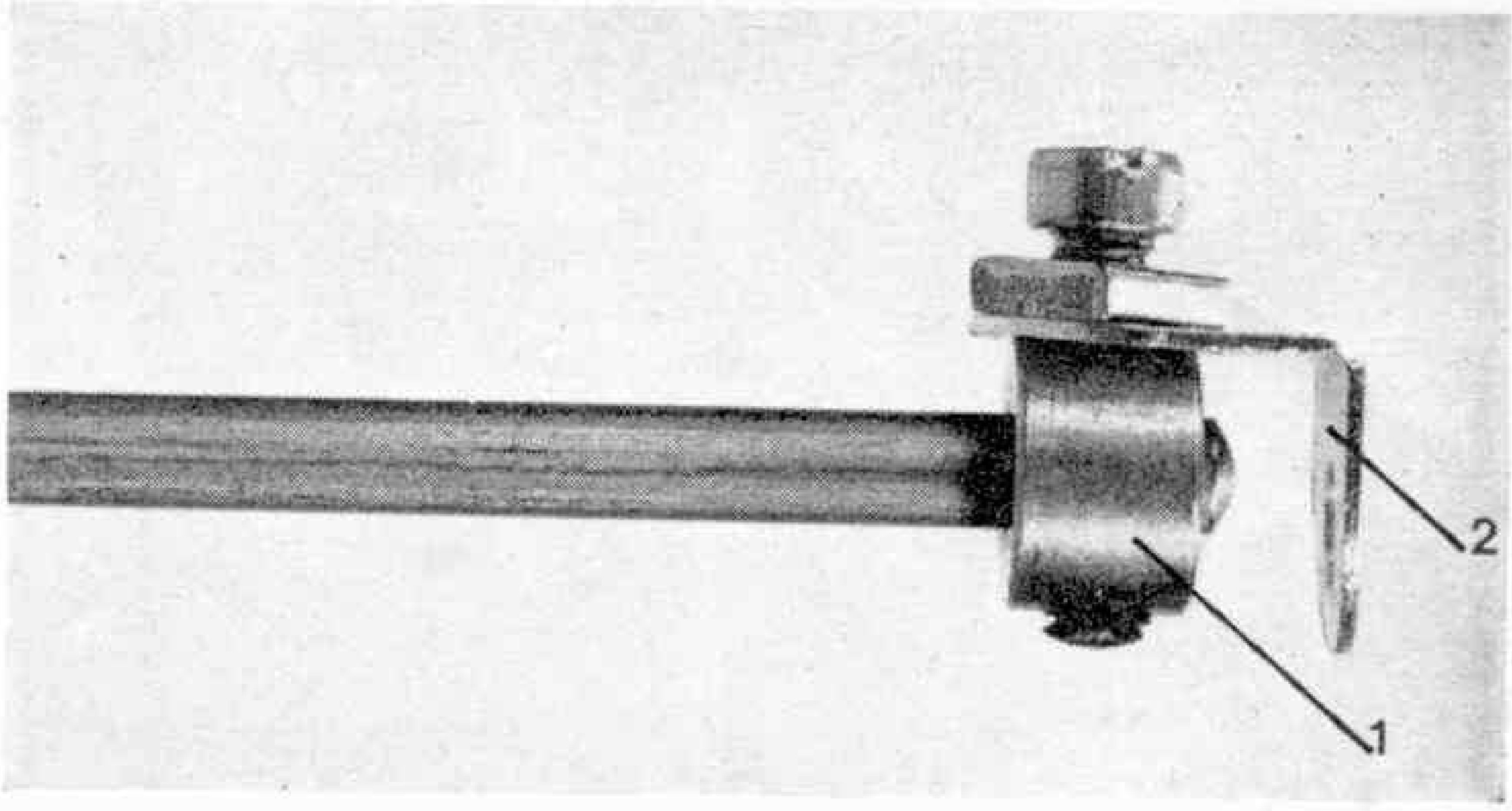
The theory behind the mechanism should now be evident. Under normal, straight, running conditions, the Motor Tyres incorporated in the clutch units are free of all contact with the casing and thus both sections of the main axle revolve at the same speed. However, when one Rod 16 is moved, the appropriate Motor Tyre is brought into contact with the adjacent Boiler End which of course slows down that particular section of the axle while allowing the other section to continue turning unrestrained. Consequently, as Mr. Capet says, 'A convenient form of steering is obtained'.

Small-throw crank

On a different subject, I was talking recently to Mr. Cyril Freezer, who is the Editor of the Railway Modeller and he happened to mention that, using what might be called 'bossed' Meccano parts, it is not possible to build up cranks or eccentrics which give a really small throw. This is actually quite true, as I discovered when I looked into the matter. I estimate, in fact, that the smallest throw that can be obtained, using a part with a boss, is ¼ in. yet, as Mr. Freezer pointed out, there can be many occasions when a throw even smaller than this would be extremely useful.

Mr. Freezer then described an amazingly simple unit he had designed and which you will see illustrated on this page. It gives a throw as small as ⅛ in. and consists of just four parts —a Collar 1, an Angle Bracket 2, a Nut and a Bolt. As you can see, the Angle Bracket is attached to the Collar by the Bolt which passes through the elongated hole of the Bracket and into one transverse tapped bore of the Collar. The Nut is tightened against the lug of the Bracket to make the fixture secure—easy!

It is interesting to note, by the way, that in the absence of any other suitable parts, the above unit can be modified to give a throw of something like ⅜ in. Exactly the same parts are used in exactly the same order, but the Angle Bracket should be reversed so that its free lug points away from the Collar instead of towards it.



Try Rocking on this Horse!

'WOW!' was the usual exclamation that burst involuntarily from people when they saw this particular Meccano model for the first time, and no wonder—it stands more than 20 ft. high, is 17 ft. long and weighs something in excess of half a ton! Based on the emblem of the Nuremberg International Toy Fair, it's a gigantic rocking horse which was built by Mr. Bob Moy and his staff in Meccano Limited's Model-building Department for the 18th International Toy Fair, held at Nuremberg, West Germany from February 12th to 17th this year. It proved to be one of the star attractions of the show, but this picture shows it erected in Meccano's canteen, which was the only building high enough to take it, before being shipped out to Germany.

Mounted on huge wooden rockers, and decorated with over 200 coloured lamps, it spent the entire show rocking gently backwards and forwards. Like the Nuremberg emblem its 'rider' was a futuristic tower equipped with a bright revolving light similar to those fitted to breakdown vehicles in this country. An estimated total of 60,000 parts, including more than 20,000 Nuts and Bolts were used in the model and yet it took four people only six weeks to build. But I wouldn't like the job of dismantling it!

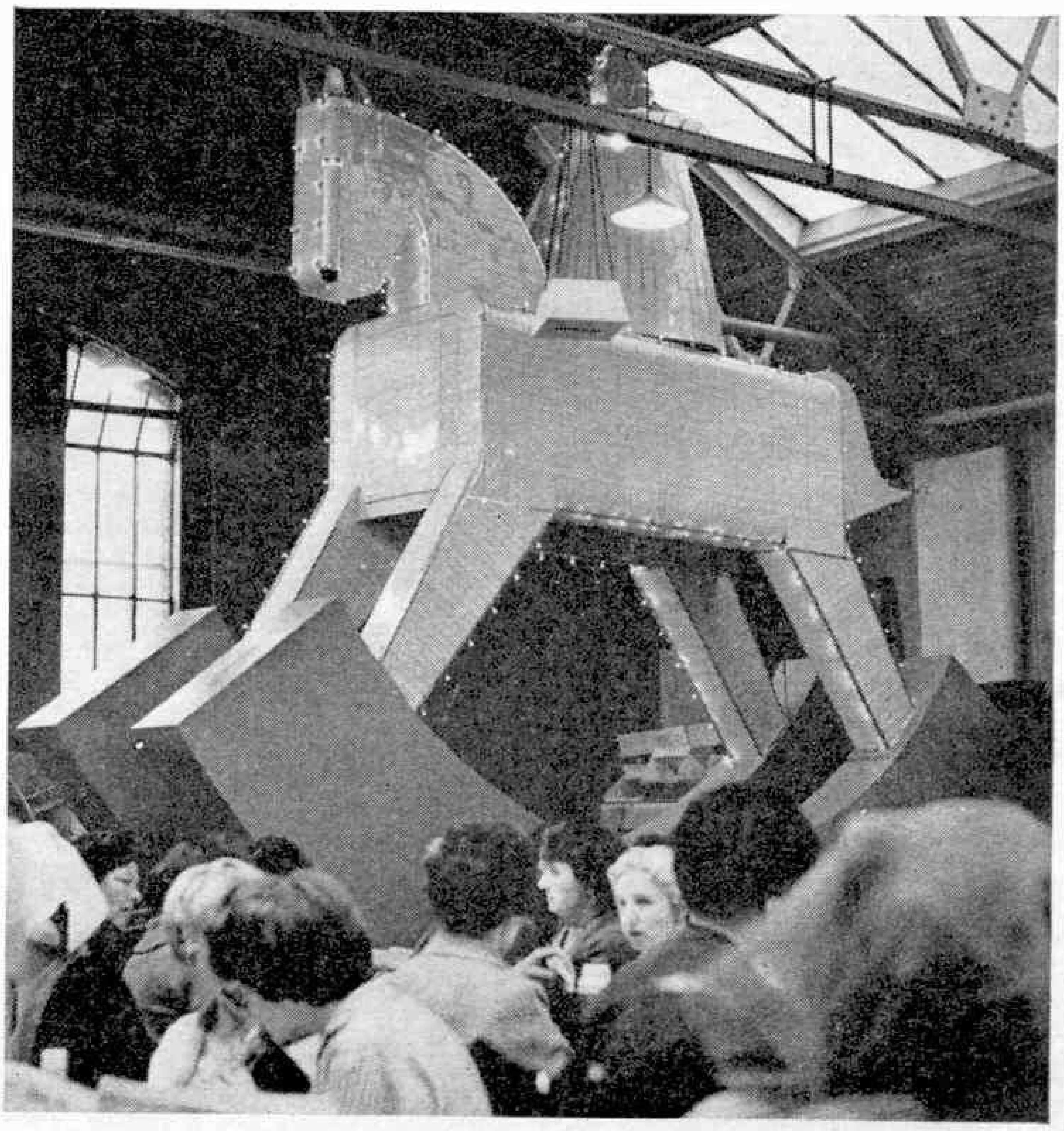
Parts required for differential

2 of No. 2
2 of No. 10
4 of No. 16
2 of No. 17
2 of No. 22
1 of No. 24b
1 of No. 24c
11 of No. 26
1 of No. 26b
1 of No. 28
30 of No. 37a
6 of No. 37b
12 of No. 38
6 of No. 59
2 of No. 81
4 of No. 111
2 of No. 111a
2 of No. 142c
2 of No. 162a
2 of No. 171

Parts required for Small-throw crank

1 of No. 12
1 of No. 37a
1 of No. 37b
1 of No. 59

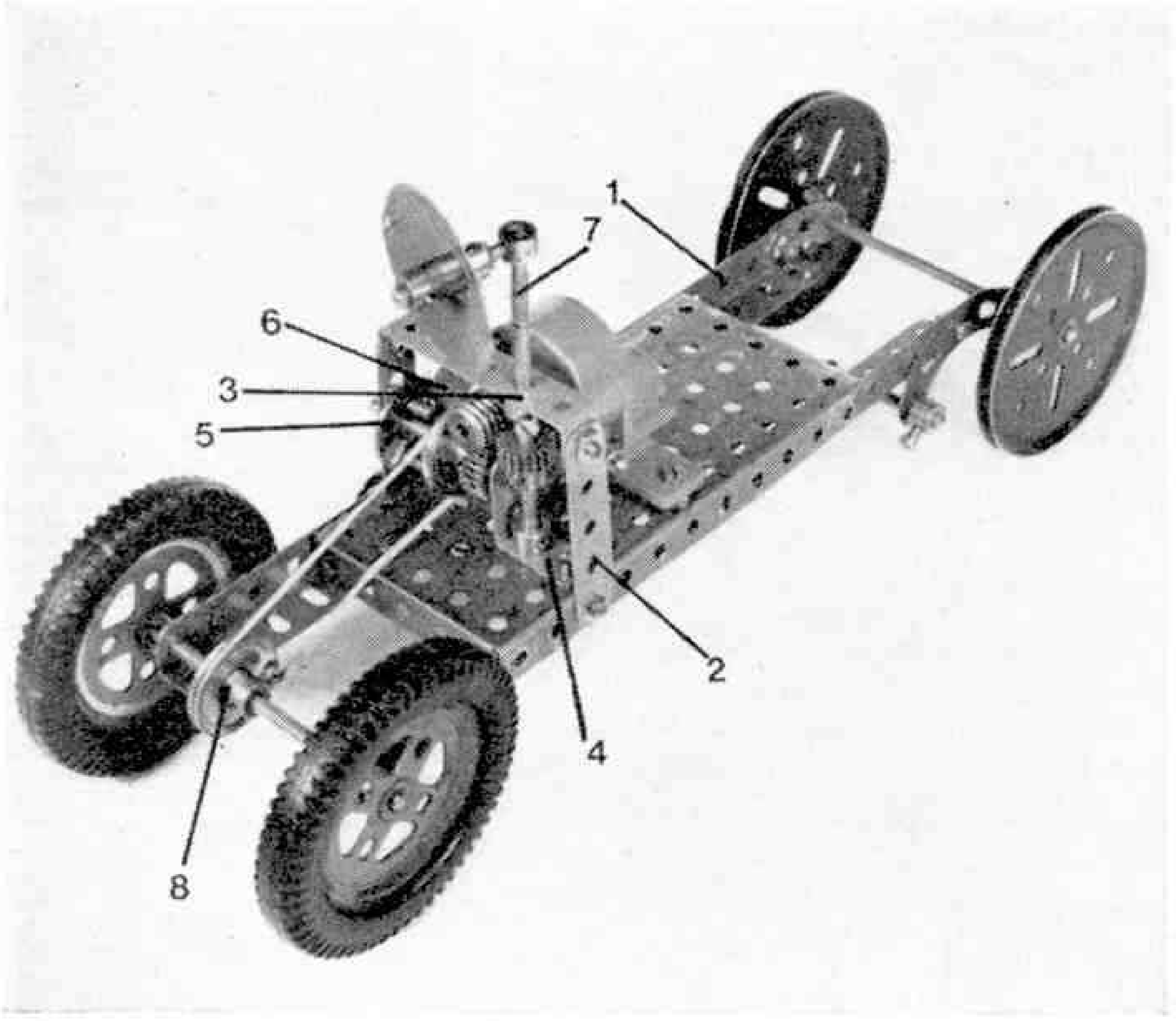
The vast Meccano rocking horse stands more than 20 ft. high, is 17 ft. long and weighs over half a ton! It was built specially for the 18th International Toy Fair at Nuremberg, West Germany

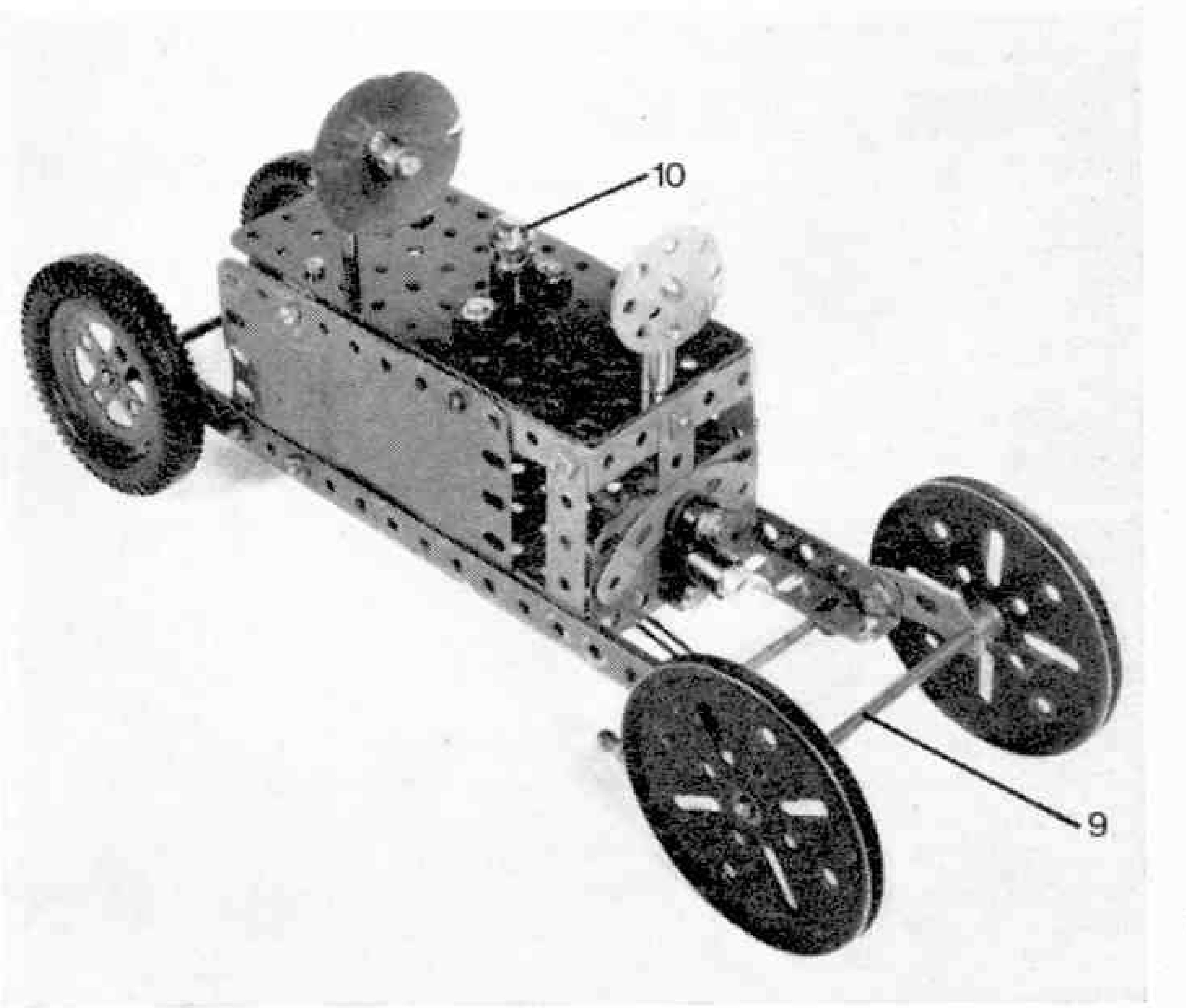


THAT'S THE TICKET

By Spanner

Meccano model builders have a reputation for being abreast of the times, and some are even several jumps ahead! Such a person is the MM reader who built the Lunar Vehicle which Spanner describes below.





LAST July, I advised Meccano designers short of new models to build to study the dawning Space Age for ideas. As a result, young M.M. reader F. C. Bentham of Ealing, London, has come up with this simple but splendid Lunar Exploration Vehicle.

Once a dream of Science Fiction writers, landing a man on the moon is now very much an imminent reality. If all goes according to plan, in fact, the Americans will have succeeded in doing just that by the year 1970 and, for all we know, the Russians may have succeeded by the time this article goes to press!

Without a doubt, the first astronaut to set foot on the lunar surface will not stray more than a few yards from the safety of his spacecraft. Future expeditions, however, will go further and further afield so that, in time, some form of surface transport will certainly be required if the moon is to be properly explored. Such a 'lunar vehicle' might well turn out to look something like the Meccano model featured here. It was designed and built by a young M.M. reader who, I feel, shows remarkable promise. He is certainly very mechanically-minded as he has not only produced the basic model illustrated, but has also designed an extremely effective suspension system that can be fitted to it.

Construction of the model is pretty obvious from the two very good photographs which, incidentally, were supplied by Mr. Bentham. The chassis is obtained from a 5½ in. by 2½ in. Flanged Plate, which is extended an equal distance at each end by two 9½ in. Angle Girders 1. Two 2½ in. Strips 2, connected at the top by a 2½ in. by ½ in. Double Angle Strip 3, are bolted one to each side flange of the Plate, while a 1 in. by 1 in. Angle Bracket 4 is bolted to the top of the Plate. Journalled in the vertical lug of this Angle Bracket and nearside Strip 2 is a 2 in. Rod carrying a ½ in. Pinion, a 1 in. fixed Pulley and a 1 in. Bush Wheel 5 (Elektrikit part No. 518), in alternate holes of which four Contact Studs are fixed. The Pinion engages with a Worm on the output shaft of an Emebo Motor fixed by Bolts to the top of the Flanged Plate but spaced from it by a Nut on the shank of each Bolt.

A 1 in. Wiper Arm 6 is bolted to an Insulating Fishplate attached to Double Angle Strip 3 by an Angle Bracket, and is arranged so that it makes contact with the shanks of the Contact Studs as Bush Wheel 5 revolves. The Wiper Arm must make contact with no metal part of the model other than the shanks of the Contact Screws.

Held, vertically, by Collars in the Flanged Plate and Double Angle Strip 3 is a 4 in. Rod 7 that carries a ½ in. Pinion. This Pinion also meshes with the Worm fixed on the Motor output shaft, while the 1 in. Pulley on the Rod carrying the other Pinion is connected by a Driving Band to a 1 in. Pulley 8 fixed on a 3½ in. Rod journalled in the end holes of Angle Girders 1. This Rod is held in place by two 2 in. Pulleys, each of which is fitted with a Motor Tyre to represent the rear road wheels. Each front wheel is provided by a 3 in. Pulley mounted on a 3½ in. Rod journalled in two 2½ in. Stepped Curved Strips lock-nutted through their centre holes to the other ends of Girders 1. Another 3½ in. Rod 9 is journalled in the Stepped Curved Strips and this is connected by a driving Band to the Flanged Plate, thus providing suspension.

Construction of the body really needs no description as it is evident from the top photograph. The only thing to remember is that a 5½ in. by 2½ in. Insulating Flat Plate acts as the roof through which, incidentally, Rod 7 protrudes. Mounted on the end of the Rod is the radar scanner obtained from a Conical Disc, a Short Coupling, a Collar and a 1⅛ in. Bolt. An Elektrikit Lamp Holder with Lamp 10 is bolted to the Insulating Flat Plate, as also is a Slotted Core for Cylindrical Coil (Elektrikit part No. 527). An 8-hole Wheel Disc is fixed to this Core, as shown. Finally, another Elektrikit Lamp Holder is bolted to a 1½ in. Insulating Strip fixed to the front of the model.

In wiring the model, Wiper Arm 6 is connected by insulated wire to one terminal of the roof-mounted Lamp Holder. The other terminal of this Lamp Holder is then connected by insulated wire to one insulated terminal of the front Lamp Holder, one of the battery leads also being connected by insulated wire to the same terminal. The other terminal of the Lamp Holder is connected to the metal of the model while the other battery lead is also connected to the metal of the model. This results in both lamps being wired in parallel and yet ensures that the front lamp remains permanently 'on', while the roof light flashes.

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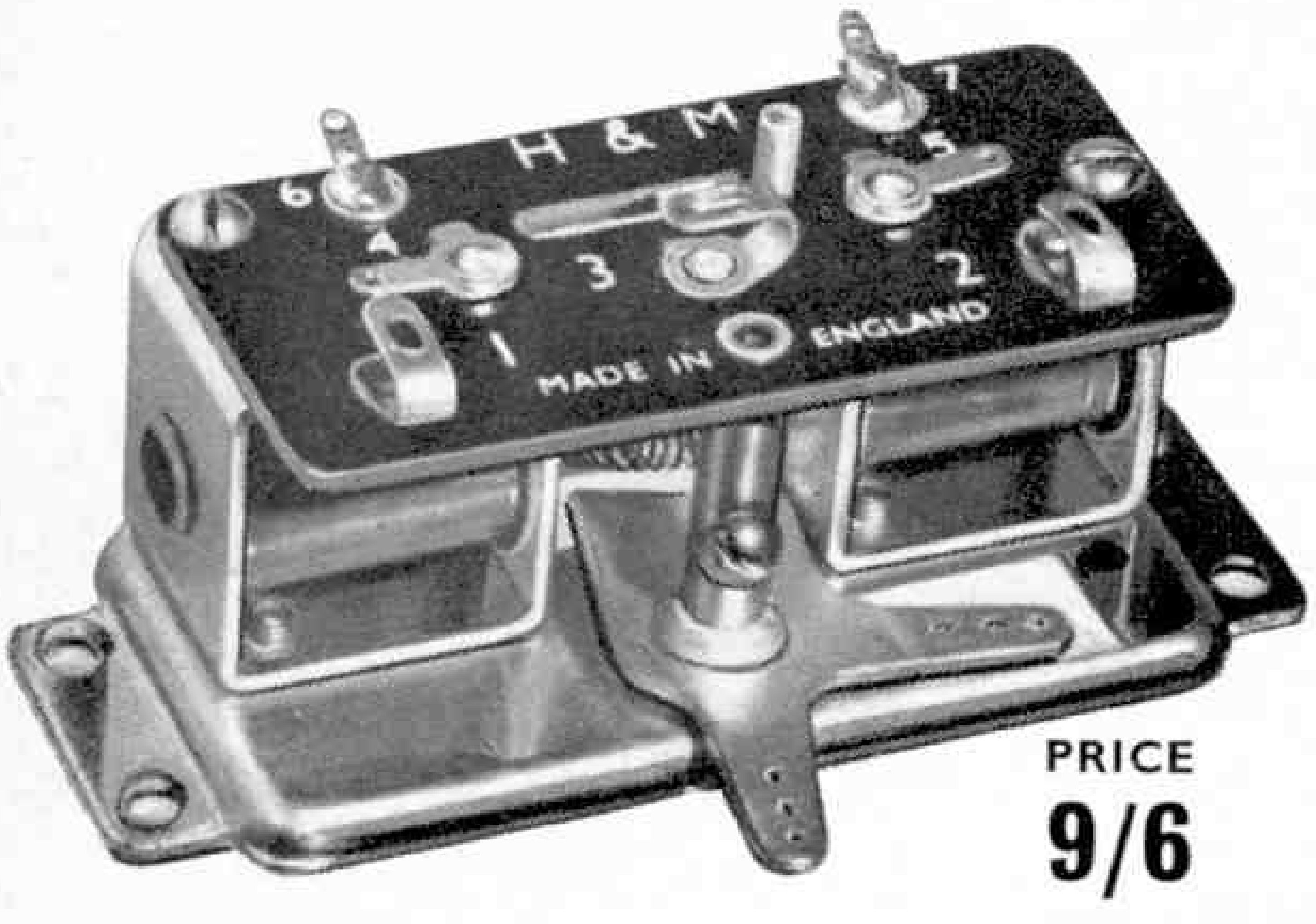

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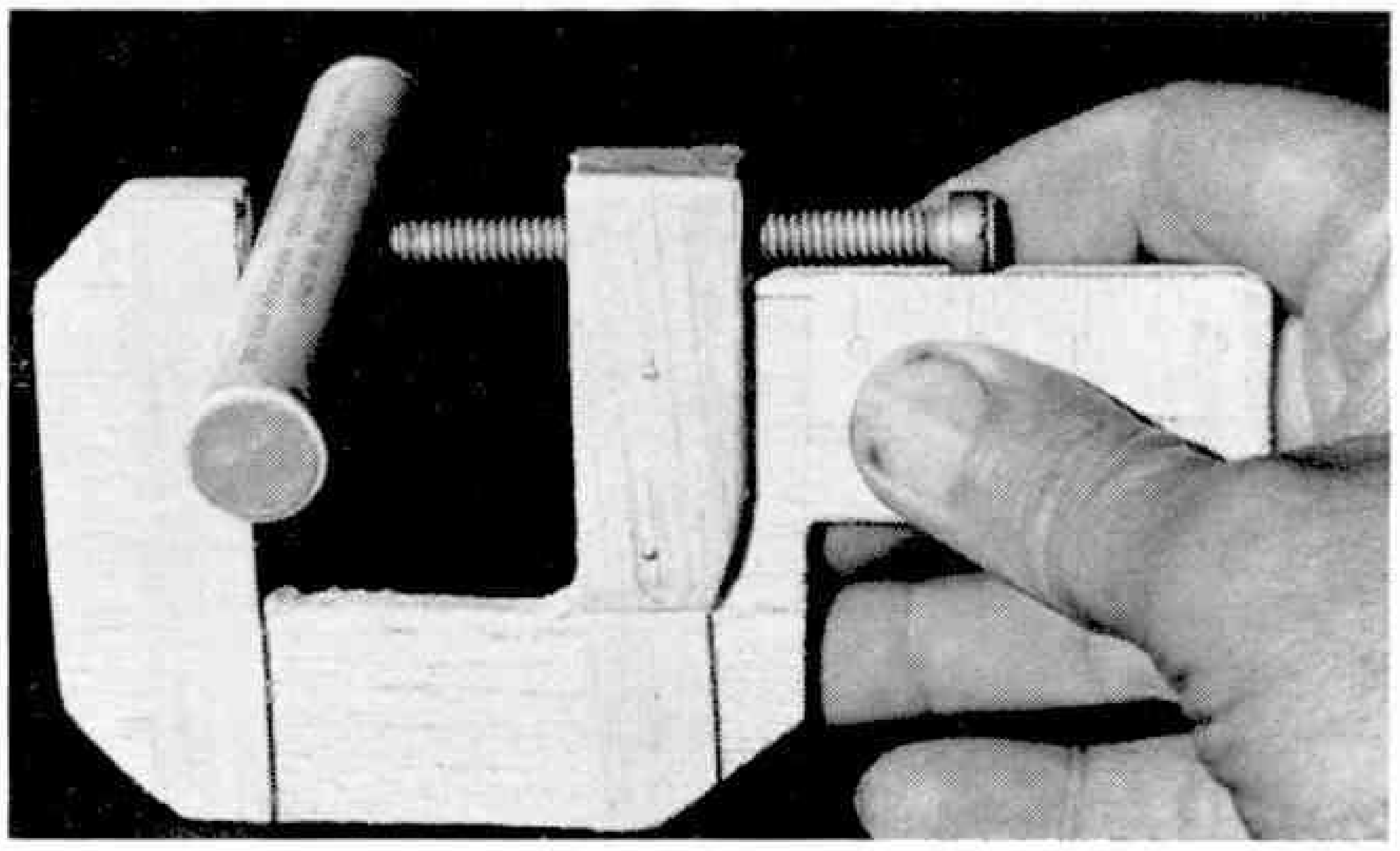

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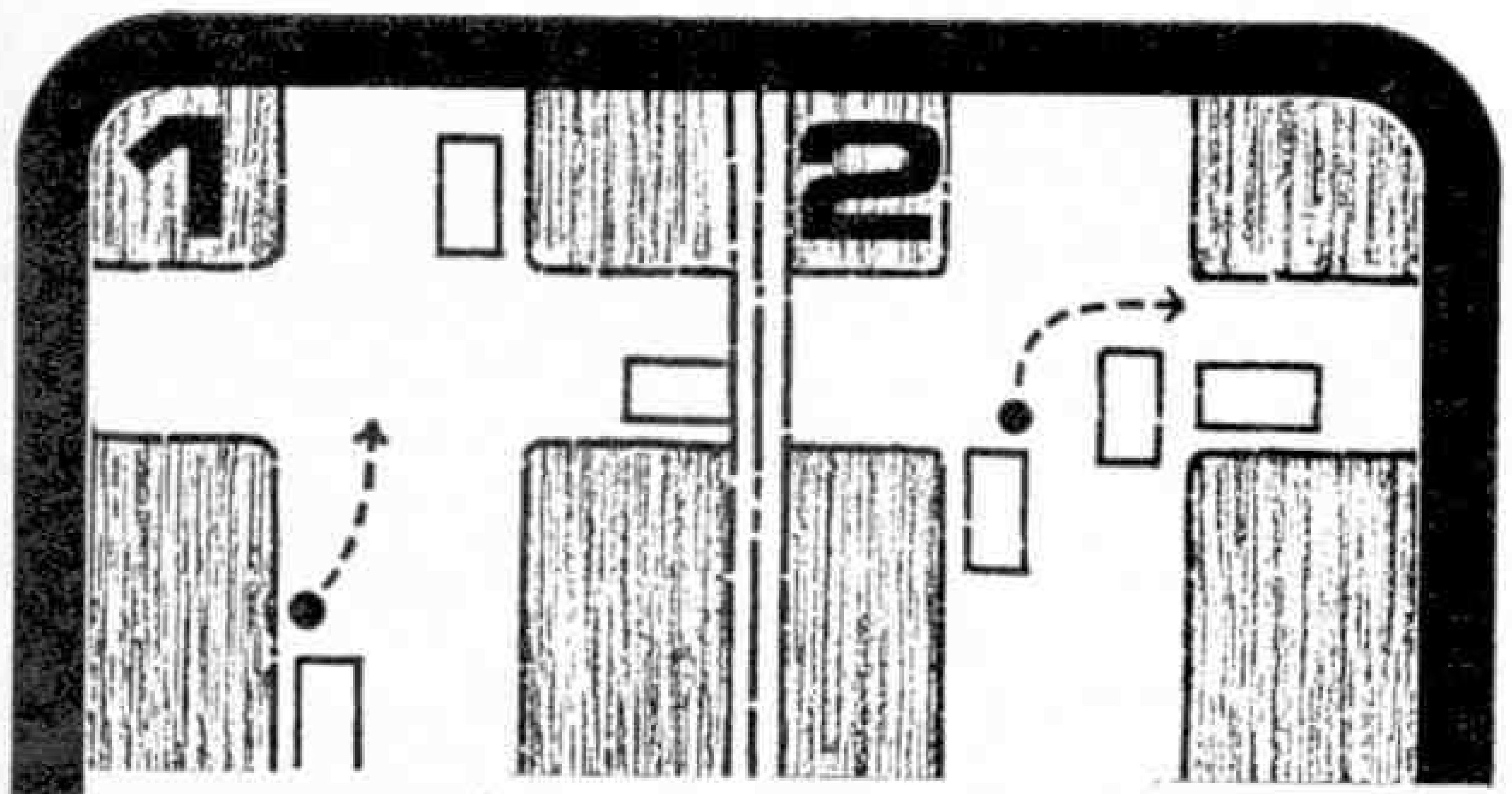
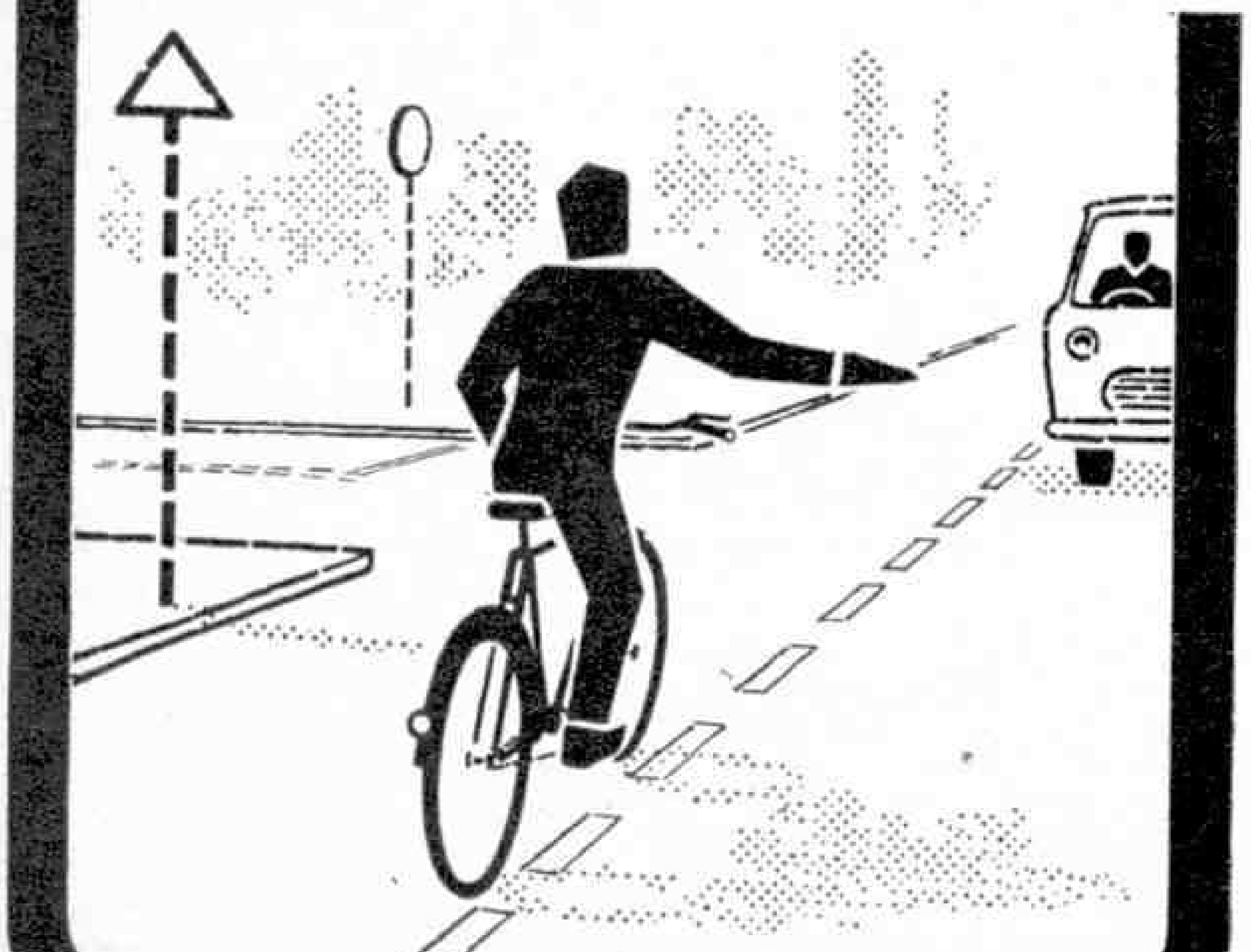


1 If you intend to turn right at a road junction, **prepare in advance!** When you are about 20 yards short of the turn, look behind you. If all is clear, signal your intention, and draw out to take up your position just to the left of the centre line.

2 Do not cut the corner. See that the road is clear to the right and left, wait until oncoming traffic has passed you, then take the corner in a wide arc. Gain the inside lane straight away, so as to let faster vehicles, which may be turning with you, overtake.

HOW GOOD A CYCLIST ARE YOU?



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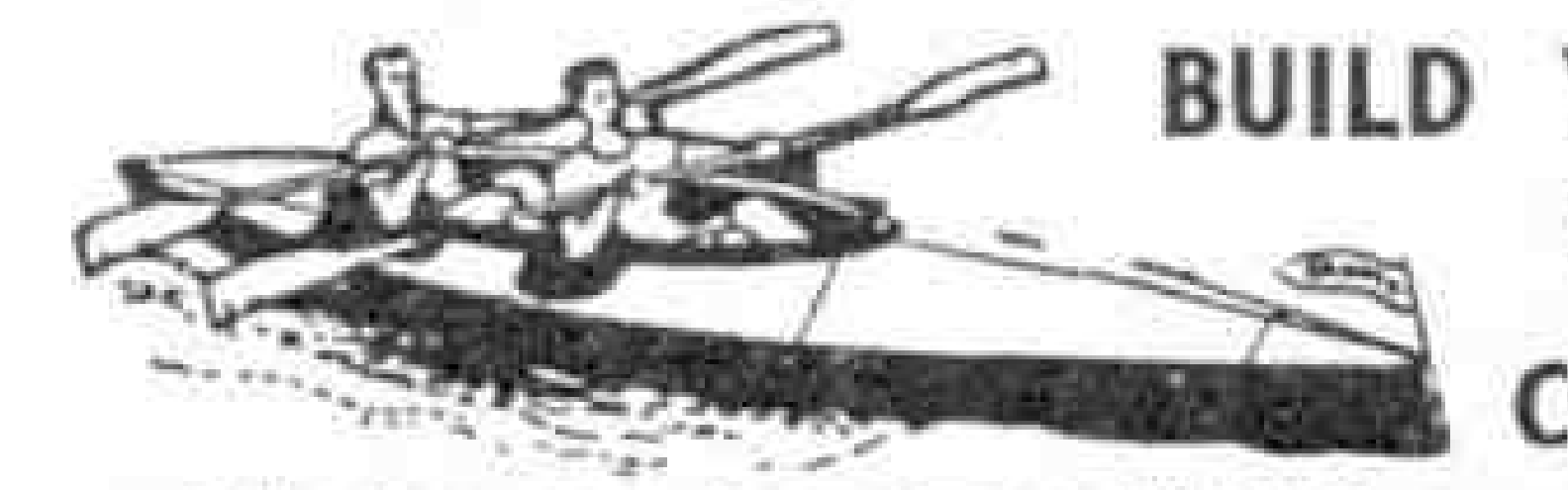

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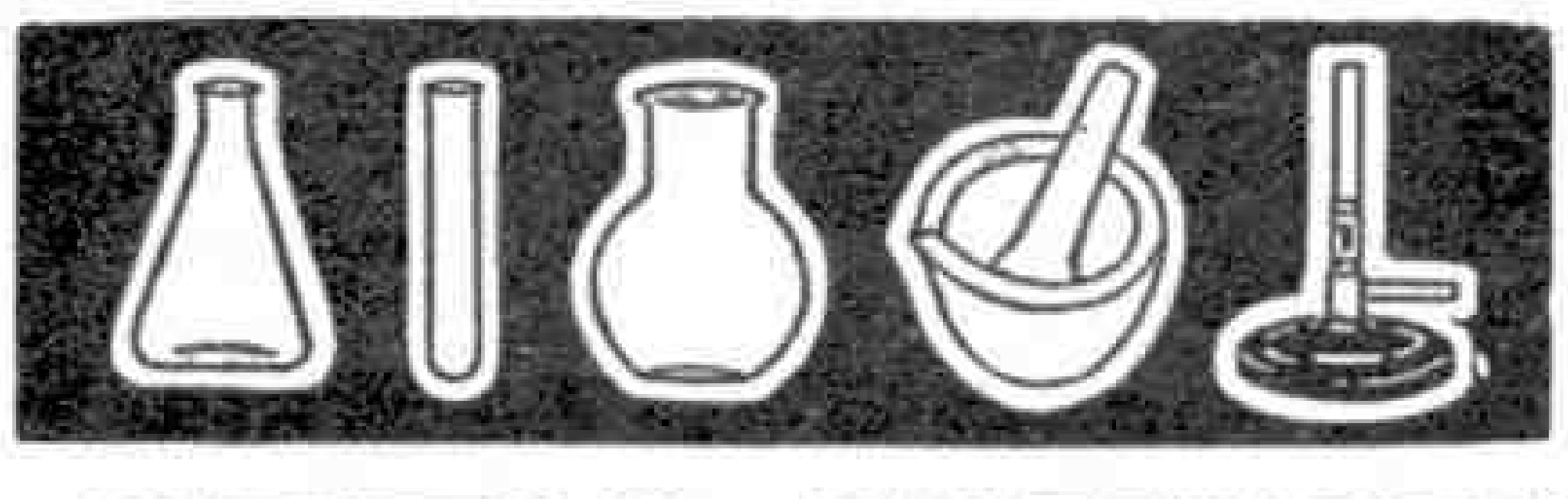

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- M.M.'s July 1956-January 1963, mint. Groves, The Angel, Fressingfield, Diss, Norfolk.
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- Obsolete Dinky and Minic Toys for sale. S.a.e. for list. Murray, 30 Silverdale Road, Gatley, Cheadle, Cheshire.
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- Triang 00 railway, £7 10s. 0d., list price, £20. S.a.e. details. Camp, 14 Dutton Road, Stockwood, Bristol 4.
- Meccano Magazines, 1935, 1940-1951, most years complete. 6 Church Close, Bucklesham, Ipswich.
- Hornby-Dublo 3-rail 100 ft. double track, various rolling stock, sundries, all perfect. Was too good for Xmas. Kloet, Devonshire Park Road, Stockport, Cheshire.
- Meccano Magazines, July 1964 to October 1966, one missing. Foxon, 5 Greyfriars Gardens, St. Andrews, Fife.
- Stamps, 50 mixed, 2s. 6d., 50 G.B., 3s. Wilson, 49 Medway Crescent, Gateshead.
- Meccano sets, No. 4 £2, No. 5 £3, two sets No. 8 £10 each, one power drive set £5 10s. 0d. All as new: clockwork No. 1 motor 15s., Meccano Magazines 1965 to 1967, Railway Modeller 1958 to 1965, Airfix Magazines No. 1 to 197. Cigarette and trade cards, mixture, 100 for 2s. 6d. To Adkins, 2 Everest Drive, Seaton, Devon.
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Wants

- Obsolete Dinkies and Tootsietoys, pre 1950. Single models or collections purchased. D. Pinnock, 10 Hurstville Drive, Waterlooville, Hants.
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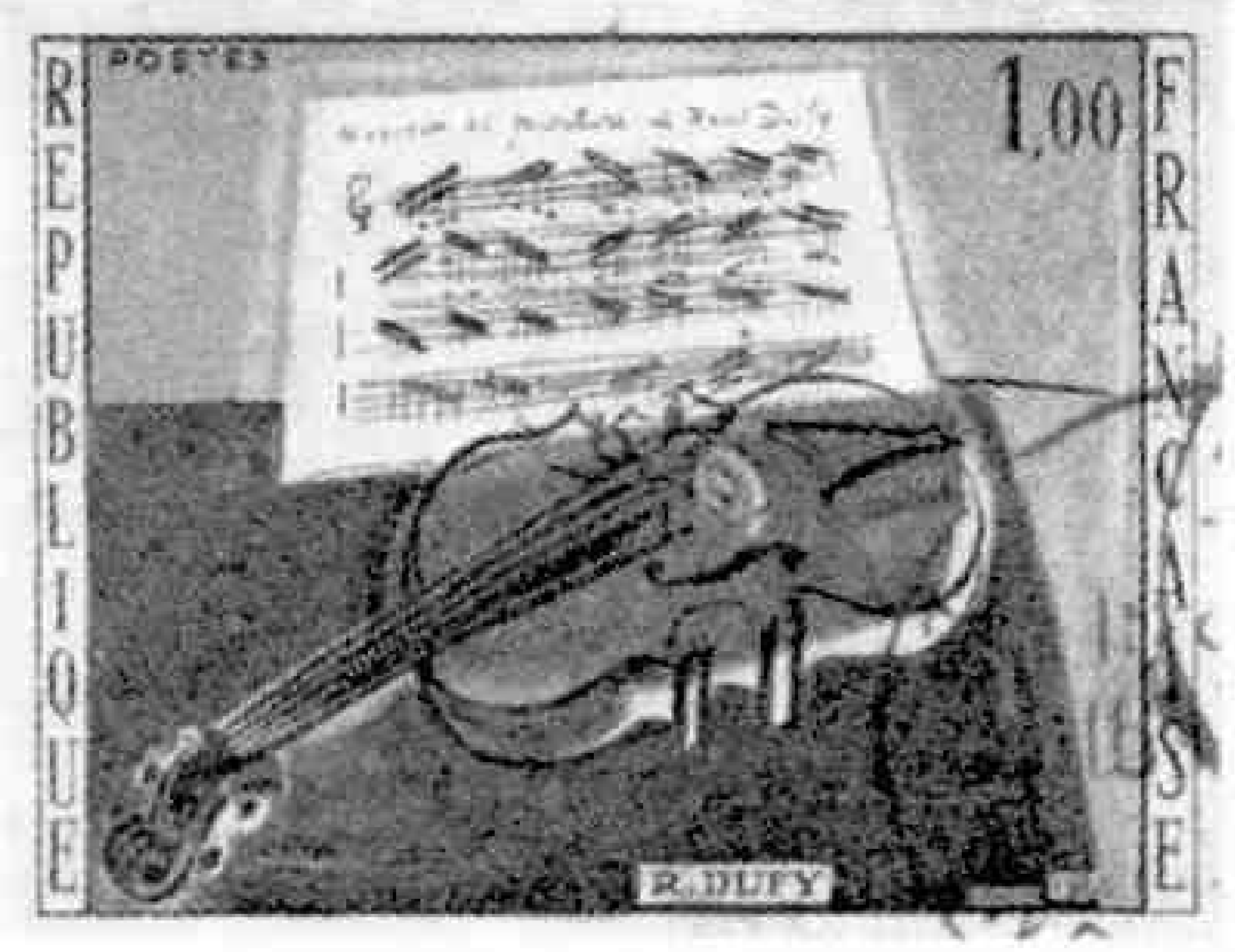
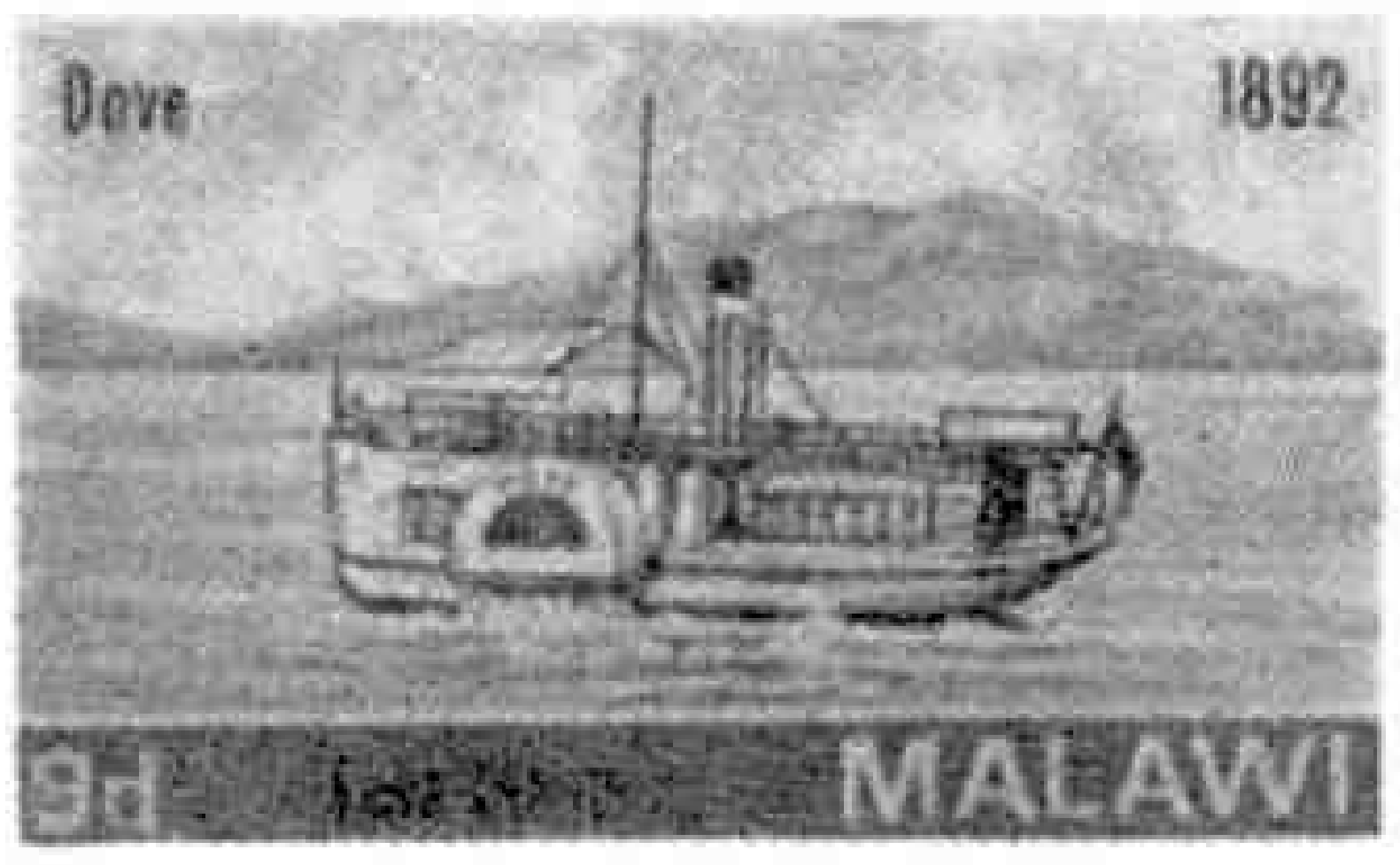
Stamps News by F. E. Metcalfe



CANADA



Hail Canada

I really must kick off this month with a few words about the new definitive issue for this great sister country which was released February 9. Canada, like say Great Britain and the Irish Republic, may bring out special issues from time to time, but long periods elapse between the release of one definitive set and another, and thus an entirely new lot is of great interest to thousands and thousands of collectors. I wish there were room to illustrate all the new Canadian issues, for each value does the Postal Administration great credit. First of all, from 1 c. to 5 c. the Queen's portrait appears with different background views of Canada in each case. Then from 8 c. to $1 the whole design shows pictures of Canada. These designs are based on paintings by famous Canadian artists, and all are tremendously interesting. I imagine that few will be able to resist this issue and, if we cannot afford it mint, well used copies will come along in time quite cheaply, if we can only wait. But note the top value, the $1, around 8s. Canada, with its great postal needs, gets along quite well with this. But those small island colonies of ours, including British Antarctica, with hardly any postal needs at all, must have £1 stamps. Bit of a joke isn't it! Still, we do love those Colonial stamps, for nowadays the designs are so attractive and very well printed.

East African Airways

There's nothing like stamps to mark important national events (it took us almost 120 years to find this out, though most other countries cottoned on much quicker), so it was perhaps no surprise that the East African trio (Tanzania, Uganda and Kenya) would select those important bits of paper to commemorate the 21st anniversary of their East African Airways, a service of which they have every right to be proud. So last December they issued a set of four stamps to celebrate that anniversary, and as each value depicts one 'plane or other which has been used throughout the years, no doubt many Meccano Magazine readers will be keen to get a set. Actually, the airline started on January 1, 1946, and its capital, a mere £50,000 (not enough nowadays to do more than buy a pair of wings) was all it had to start with. Now there are regular services to 33 centres, and actually 3,118 employed to run things. Of these, 1,906 are Africans, so it's a home job all right. How nice it would be to do one of the trips, say from London to Addis Ababa.

Lake Ships

What a difference to sales popular designs make. This thought has been promoted by the way the set of stamps issued by Malawi, January 4, has sold. A dealer told me that it was his January best-seller, and he could only put that popularity down to the designs of the stamps. There are four values, with the 4d. depicting 'Itala I' which was running on Lake Malawi, 1865; the 9d. with 'Dove' of 1892; the 1s. 6d. with 'Chauncey Maples' of 1901; and the 3s. with 'Guendolen' of 1899. Ship stamps are popular with many thematic collectors all over the world and, as these Malawi stamps are particularly attractive, well, 'hot cakes' these! And by the way, if you go in for ship stamps, then look out for a fine set which will be issued piecemeal by Norfolk Islands. April 17 is the tentative date for first release; these will be the 1c., 2c., 3c. and 4c. values, and will, of course, replace the existing provisionals. The next batch is due for release August 14. I am sure they also will be best sellers.

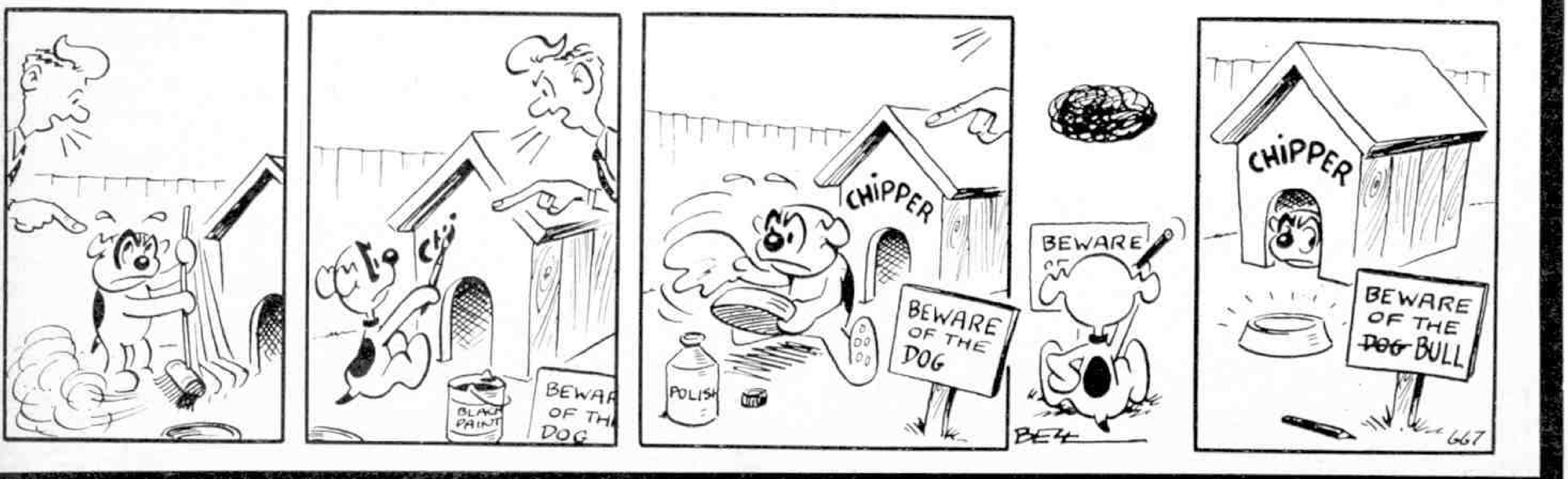
Calshot Harbour

No, these stamps, four of them issued January 2, have nothing to do with our own coast line, but that of the far away island of Tristan de Cunha. When there was the volcanic eruption in 1961, the lava flowed all over the sandy beach accessible from the village. When the islanders returned in 1963 they found no safe landing place for their boats. As fishing is the main source of livelihood, and the sea is rarely calm, a small harbour was a necessity. Though the job called for no great engineering skill, it was nevertheless a rather tricky task with the resources available. Anyhow, it was successfully completed, and what so fitting as a name to remind the islanders of their stay in England and, of course, a set of stamps to top it all. Maybe the profit from the stamps will about cover the cost of the job. I hope so.

The Tip of the Month

I have referred from time to time to various subjects as themes for thematic collections. The most popular have been flowers, birds, fishes, etc., but one that is rapidly forging its way into the top ten has to do with reproductions of famous paintings. France started it all with some magnificent stamps, but other postal administrations are seeing to it that we do not go short of 'famous paintings' and all kinds of art are appearing on stamps. For instance, the South Arabian State of Kathiri has issued a set of eight which depict paintings by Sir Winston Churchill, and a 'gradely' set it is, to quote one Yorkshire collector. If you want to start a new collection, I think 'Famous Paintings' will be very much worth your consideration.

CHIPPER



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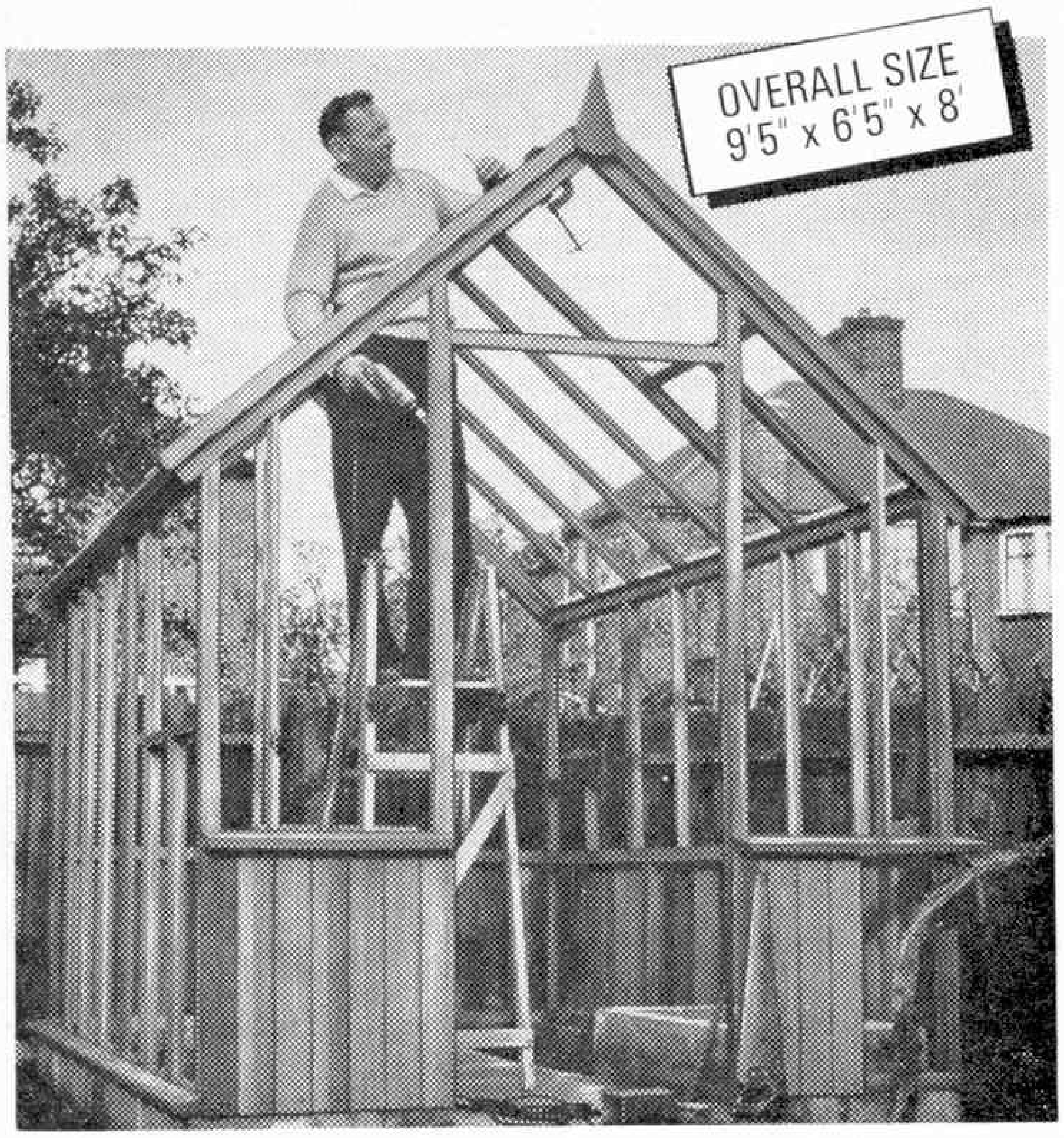

Any handyman can make this greenhouse easily and efficiently—and save pounds on the job. It's half glazed on one side so that you can lay out staging for seed-boxes, etc., with the other side fully glazed for tomato growing and similar work. Get cracking on it right away from the FREE Construction Plan in the April PRACTICAL WOODWORKING, plus additional instructions inside the issue.

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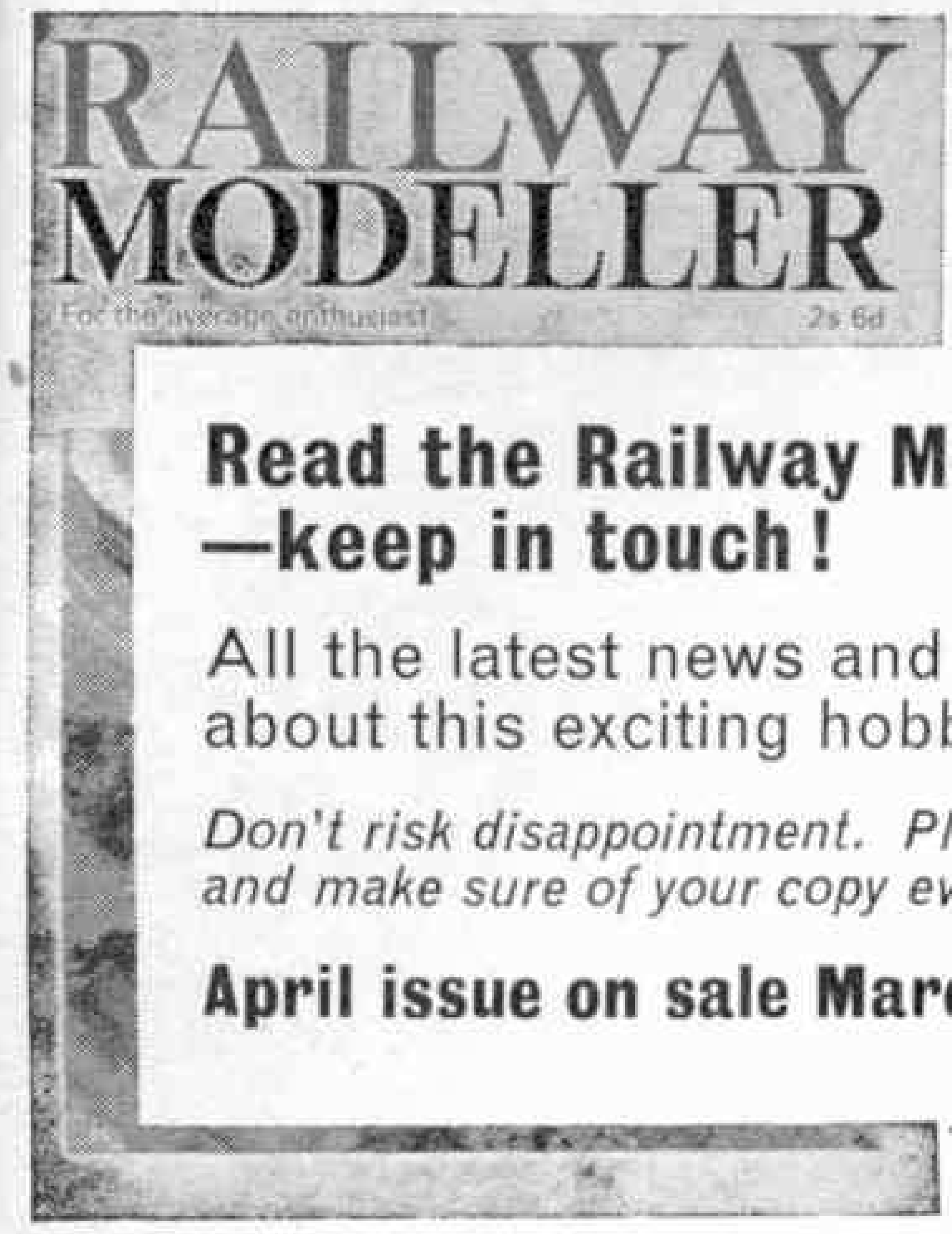

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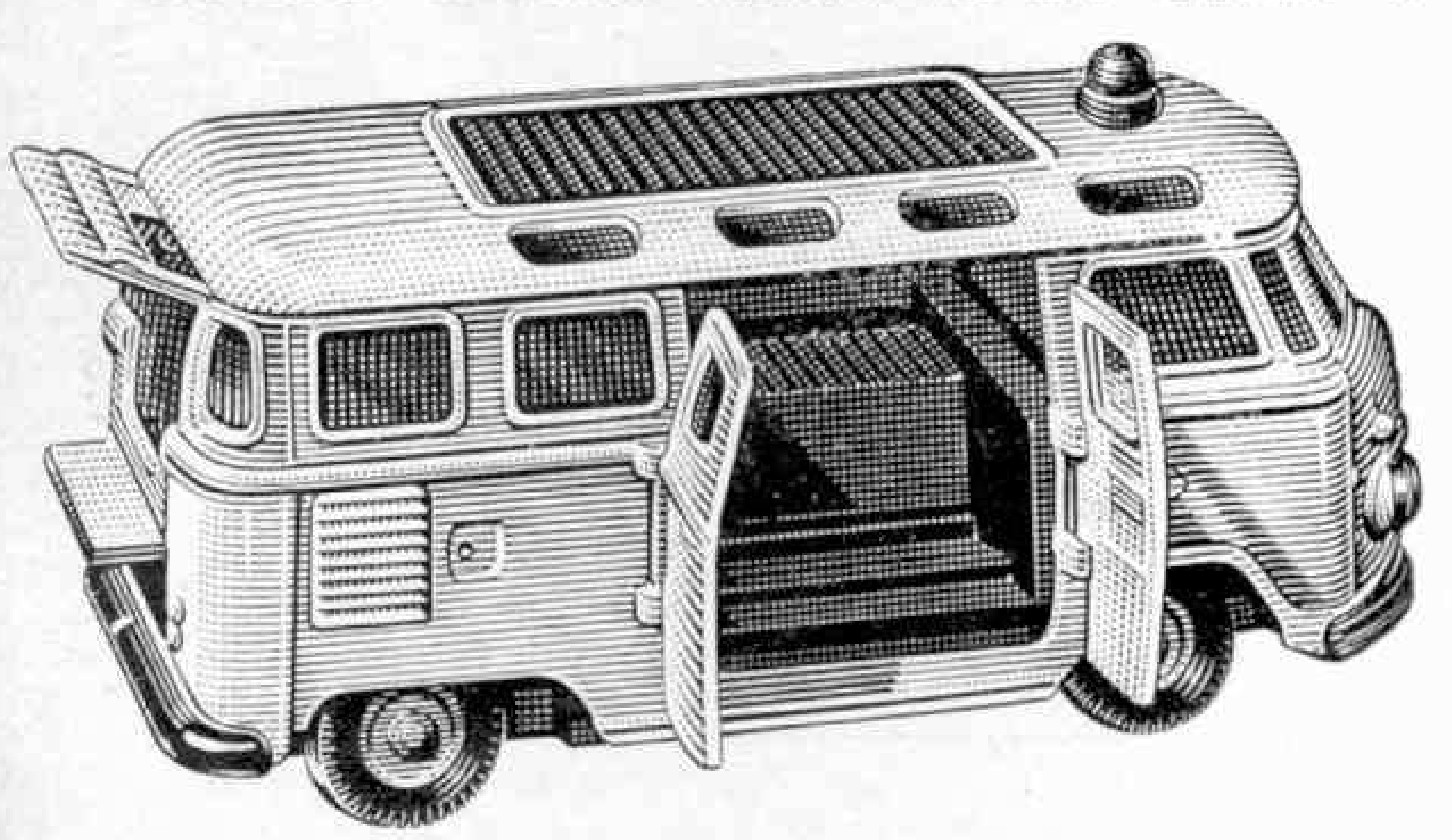

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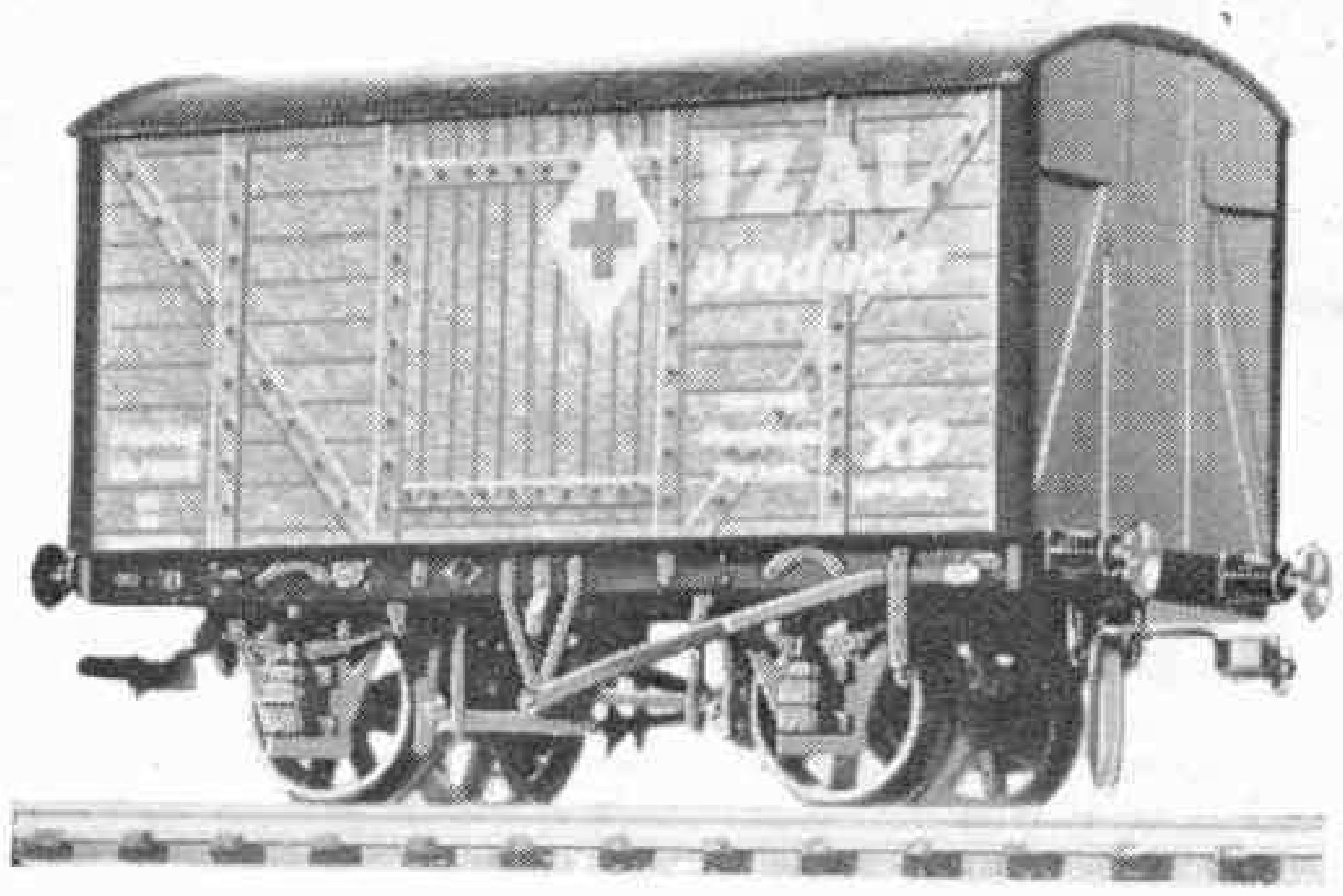

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—LATEST ISSUE

First in a new series of box-vans for OO, is this superb IZAL container kit. Accurately embossed sides are printed in full prototype colours, and the kit features all the details for which this range has become renowned—working buffer and axle-box springs, separate brake-levers etc., etc. This is a must for every OO enthusiast, a wonderful wagon indeed!

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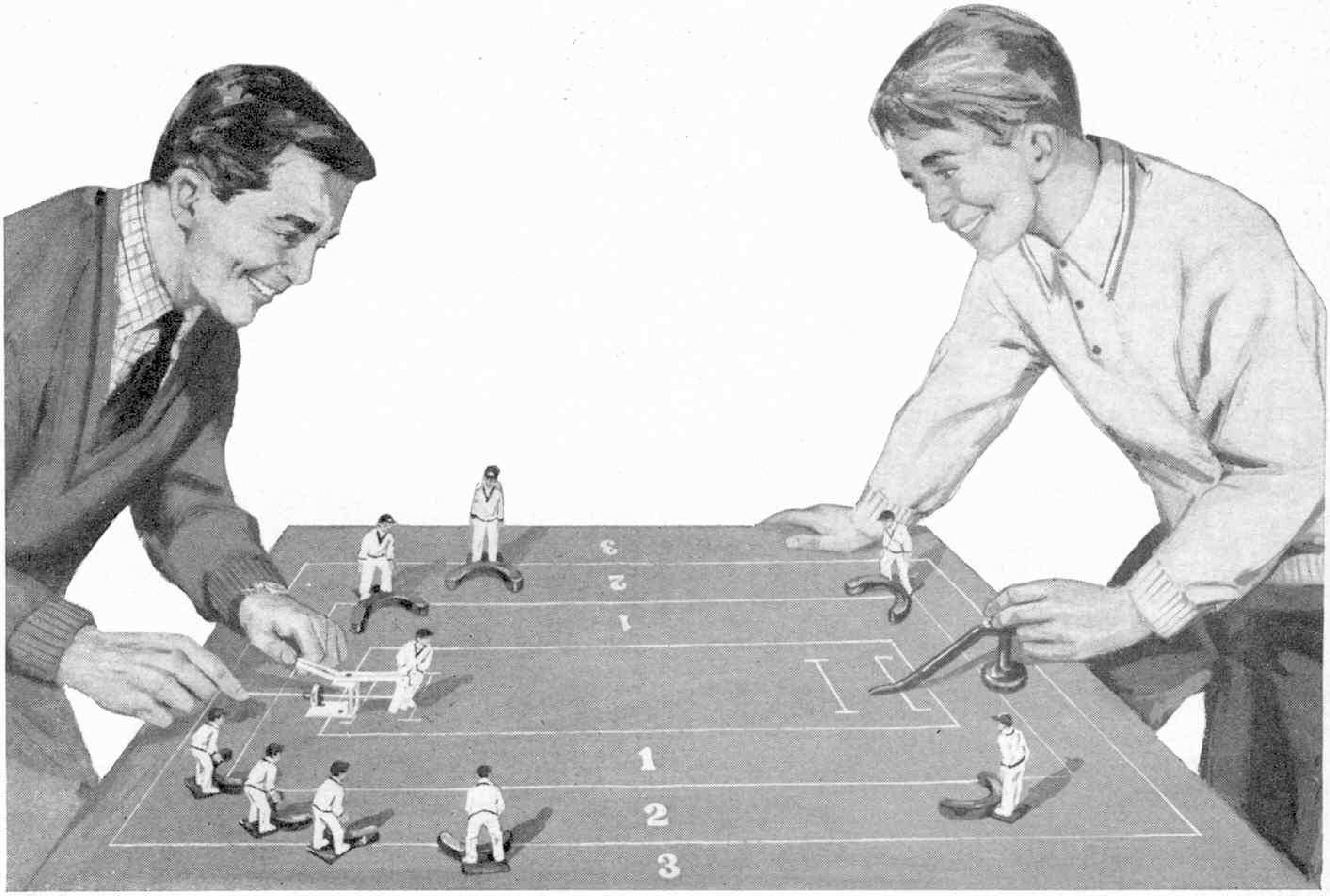

You can play real cricket shots in this fascinating game. It's great!

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Table-top CRICKET PRICE £6.2.6.

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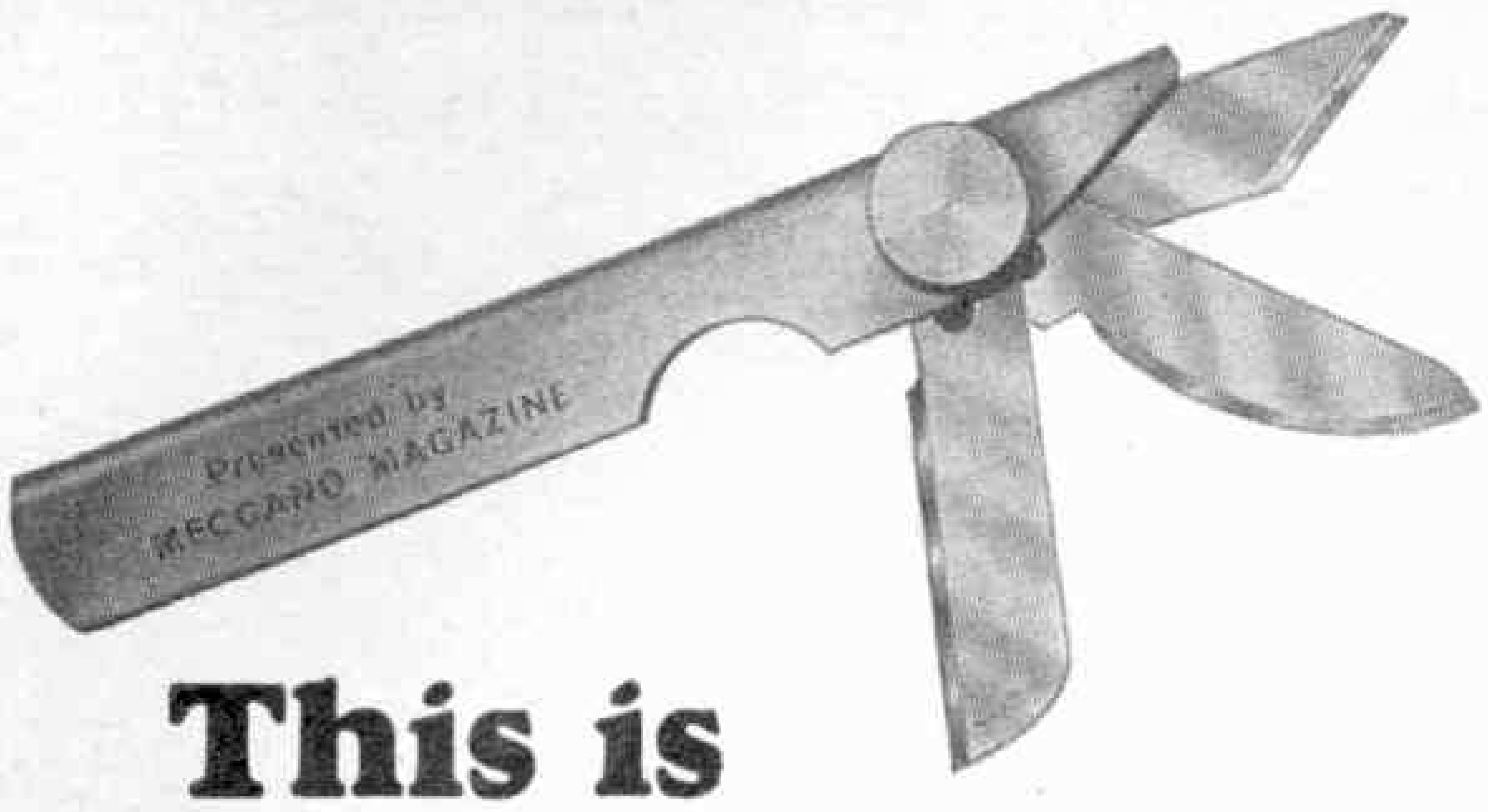

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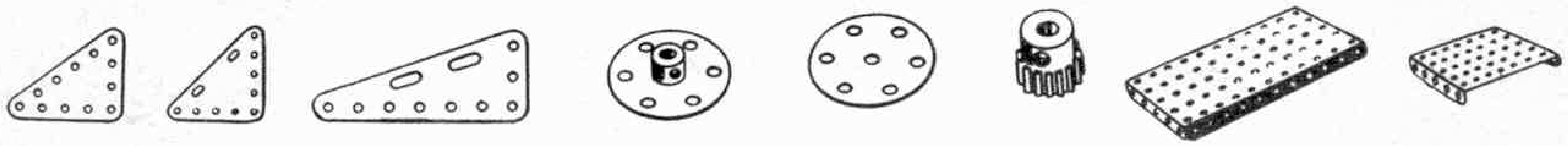

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Listed below are some of the dealers who sell Meccano accessories and spare parts. This is intended to aid enthusiasts—and there are many of them—who constantly require additional spare parts for their Sets. All dealers can, of course, order Meccano spare parts for their customers, but those listed here are among our spare part specialists.

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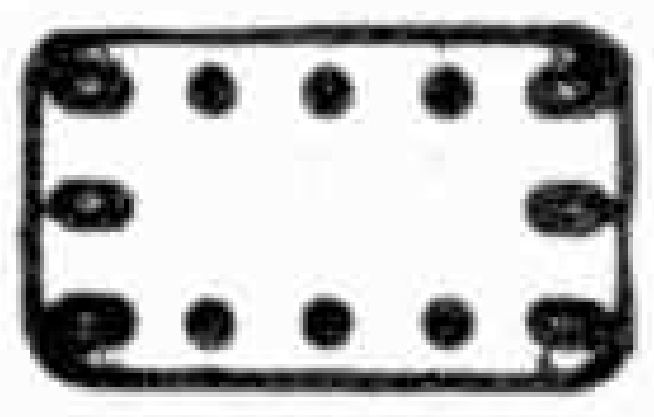

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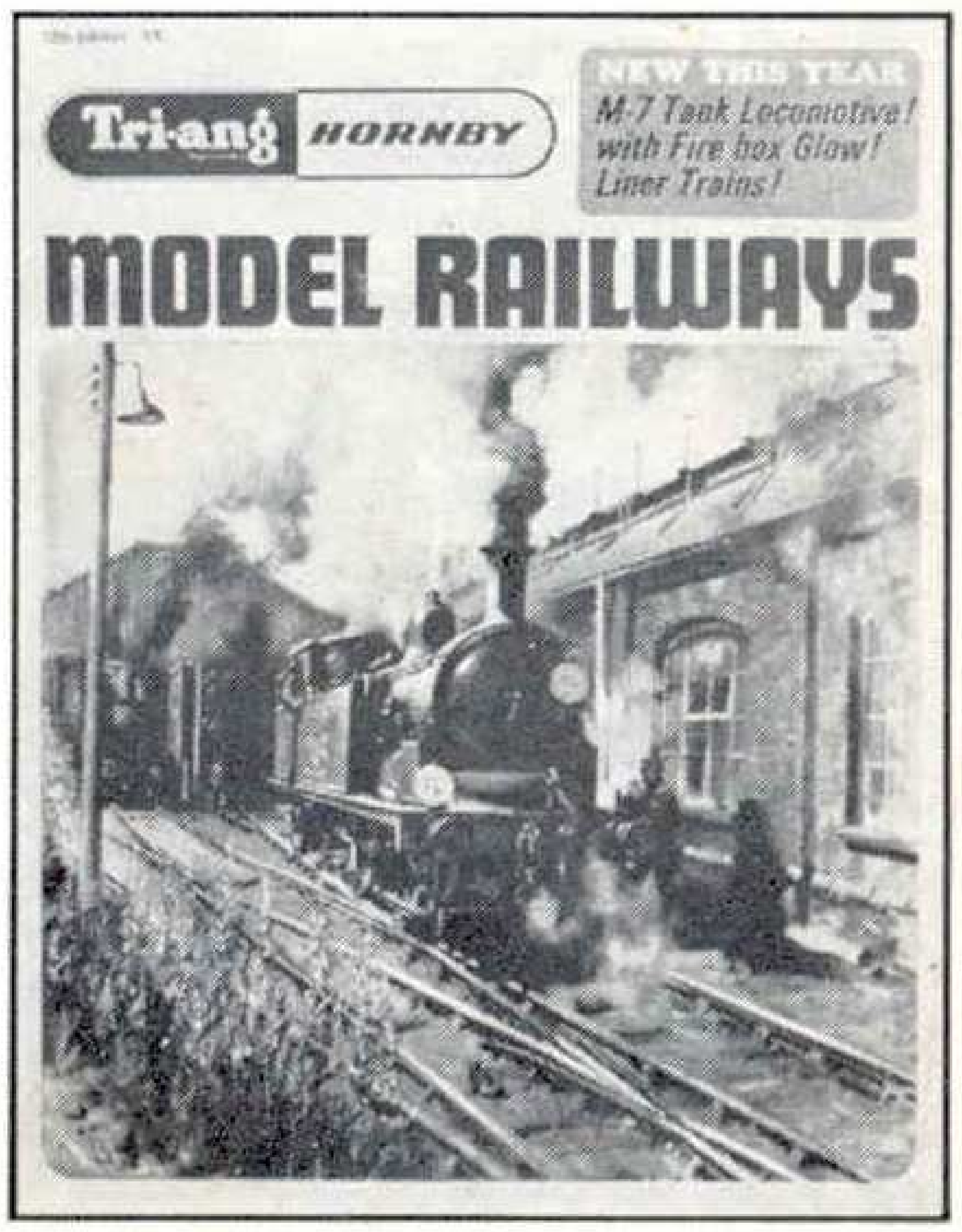

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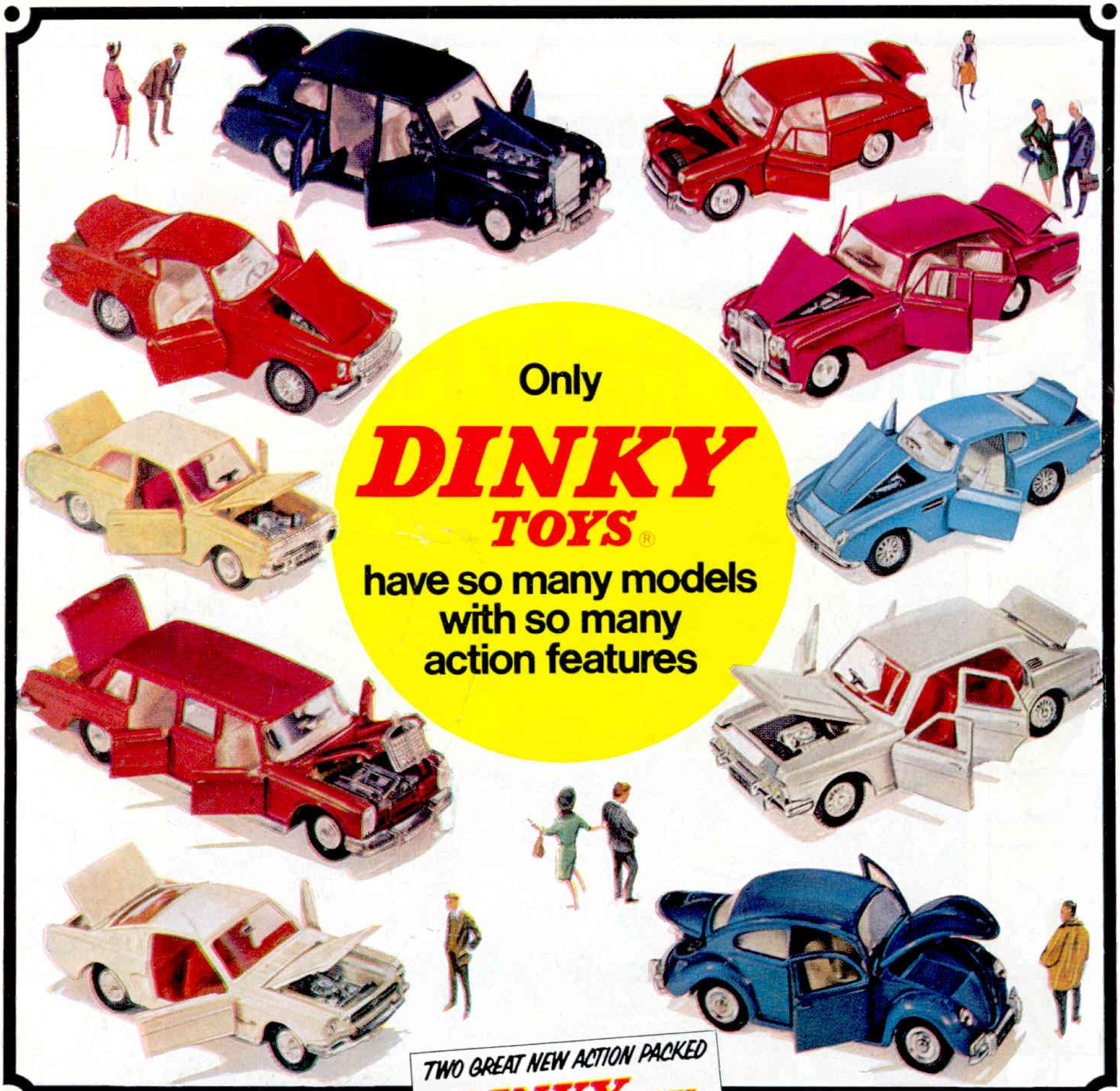

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TWO GREAT NEW ACTION PACKED

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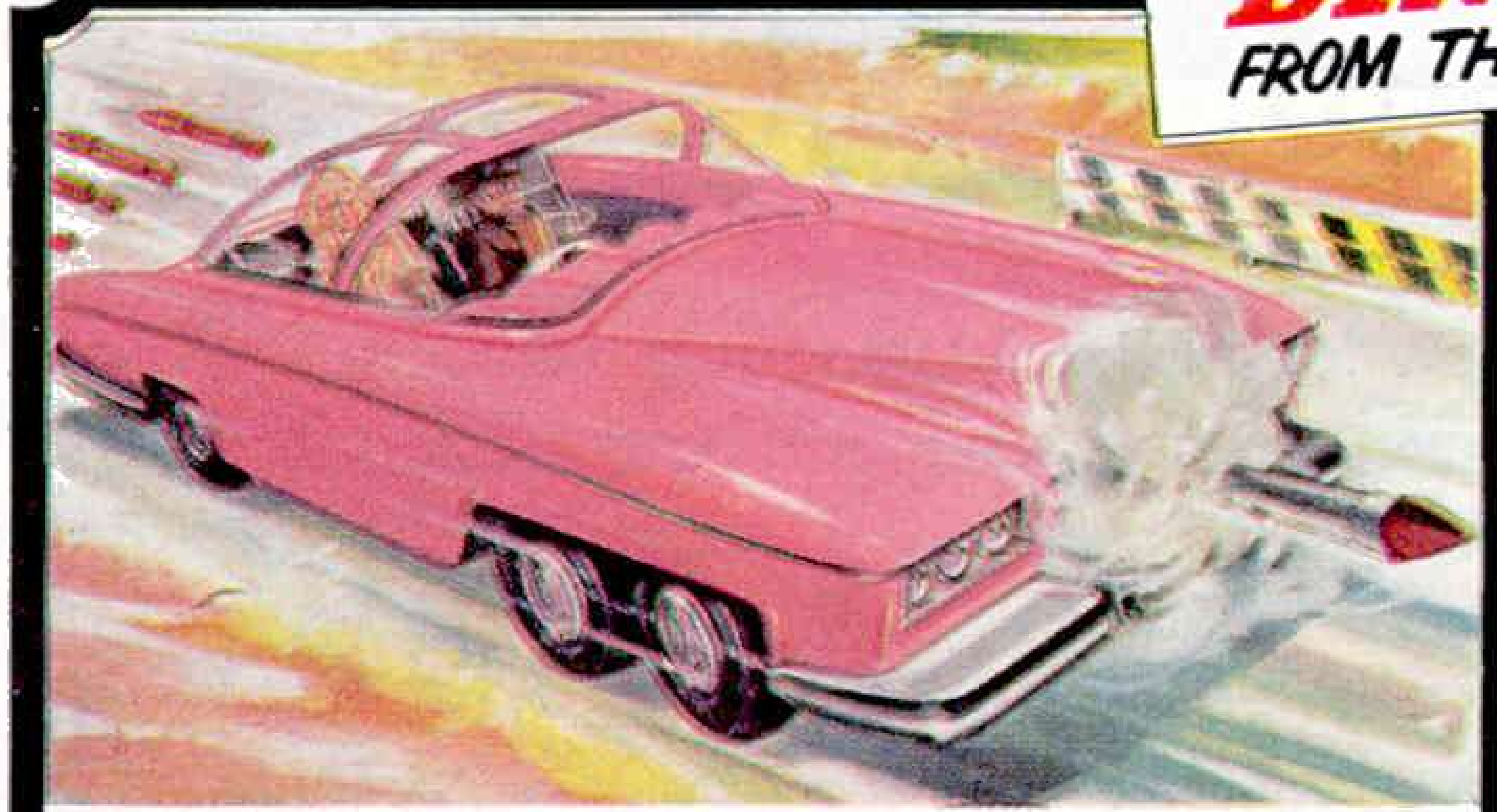
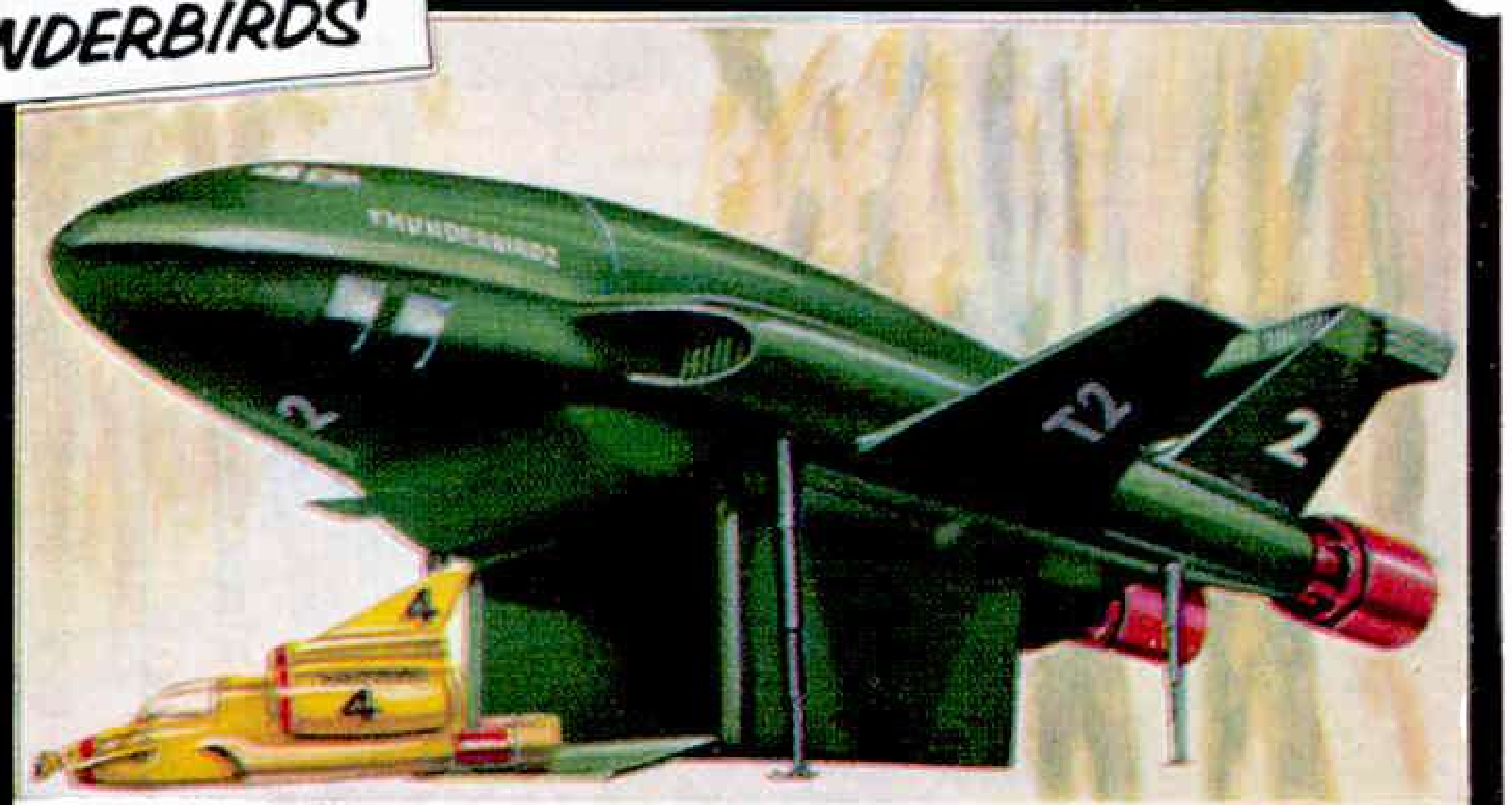


LADY PENELOPE'S ROCKET-FIRING FAB 1 •Fires 5 rockets (Hinged radiator conceals big block-buster, and there are 4 pursuit rockets) •Sliding cockpit canopy •Lady Penelope and Parker •Jewelled multiple headlights •Super Finish •Plated details. Length 5¼"



THUNDERBIRD 2 WITH THUNDERBIRD 4 •Sensational 2 in 1 special from DINKY •Thunderbird 2 has spring released telescopic legs •Pod contains Thunderbird 4 for solo flights to high adventure. •Superb details. Overall Length 5½"

From Hamleys, Harrods, Gamages, Selfridges, and all good toy shops. Manufactured by Meccano Ltd., Binns Rd., Liverpool.

There's always something new from Dinky.

Published by Thomas Skinner & Co. (Publishers) Ltd., St. Alphage House, Fore St., London, E.C.2. Printed by James Cond, Charlotte St., Birmingham 3